

**Data Summary Report:
Outdoor Activity-based Sampling
Air Re-analysis Results**

**Libby Asbestos Superfund Site, Operable Unit 6
Libby, Montana**

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Prepared for:



**U.S. ENVIRONMENTAL PROTECTION AGENCY
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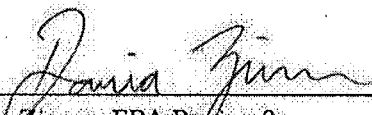
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Outdoor Activity-based Sampling Air Re-analysis Results**

**Libby Asbestos Superfund Site, Operable Unit 6
Libby, Montana**

Approvals:



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Libby Asbestos Superfund Site, OU6 Remedial Project Manager

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List of Acronyms and Abbreviations

%	percent
μm	micrometers
ABS	activity-based sampling
BNSF	BNSF Railway Company
CB&I	CB&I Federal Services, LLC
cc ⁻¹	per cubic centimeter
CDM Smith	CDM Federal Programs Corporation
CH	chrysotile
CHISQ	Chi-square
DQA	data quality assessment
DQO	data quality objective
ED	exposure duration
EDD	electronic data deliverable
EDS	energy dispersive spectroscopy
EF	exposure frequency
EPA	U.S. Environmental Protection Agency
ESAT	Environmental Services Assistance Team
ET	exposure time
FSDS	field sample data sheet
ID	identification
ISO	International Organization for Standardization
IUR	inhalation unit risk
L	liters
LA	Libby amphibole
mm ²	square millimeters
MP	mile post
NAM	non-asbestos material
NFG	National Functional Guidelines
NVLAP	National Voluntary Laboratory Accreditation Program

OA	other amphibole asbestos fibers
OUs	operable units
OU6	Operable Unit 6
PCM	phase contrast microscopy
PCME	phase contrast microscopy-equivalent
QA	quality assurance
QATS	Quality Assurance Technical Support
QC	quality control
RBC	risk based concentration
RfC	reference concentration
ROW	right-of-way
s/cc	structures per cubic centimeter
SAED	selected area electron diffraction
SAP	sampling and analysis plan
Site	Libby Asbestos Superfund Site
SOP	standard operating procedure
TAS	target analytical sensitivity
TEM	transmission electron microscopy

1 INTRODUCTION

1.1 Site Background

Libby is a community in northwestern Montana located 7 miles southwest of a vermiculite mine that operated from the 1920s until 1990. The mine began limited operations in the 1920s and was operated on a larger scale by the W.R. Grace Company from approximately 1963 to 1990. Studies revealed that the vermiculite from the mine contains amphibole-type asbestos, referred to as Libby amphibole (LA).

Epidemiological studies revealed that workers at the mine had an increased risk of developing asbestos-related lung disease (McDonald *et al.* 1986, 2004; Amandus and Wheeler 1987; Amandus *et al.* 1987; Whitehouse 2004; Sullivan 2007). Additionally, radiographic abnormalities were observed in 17.8 percent (%) of the general population of Libby including former workers, family members of workers, and individuals with no specific pathway of exposure (Peipins *et al.* 2003; Whitehouse *et al.* 2008; Antao *et al.* 2012; Larson *et al.* 2010, 2012a, 2012b). Although the mine has ceased operations, historical or continuing releases of LA from mine-related materials could be serving as a source of ongoing exposure and risk to current and future residents and workers in the area. The Libby Asbestos Superfund Site (Site) was listed on the U.S. Environmental Protection Agency (EPA) National Priorities List in October 2002.

For long-term management purposes, the Site has been divided into eight operable units (OUs). OU6 is the designation for BNSF Railway Company (BNSF)-owned property (**Figure 1-1**) that may have been impacted by the loading and hauling of asbestos-contaminated vermiculite or processed Zonolite® shipped on the BNSF line through approximately 1990, the date of the mine closure. OU6 is roughly centered on Libby, Montana (Mile Post [MP] 1319.5) and extends east to approximately MP 1301 and west to approximately MP 1341.

1.2 Document Purpose

Historic mining, milling, and processing operations, as well as bulk transfer of mining-related materials, tailings, and waste to locations throughout the Kootenai Valley, are known to have resulted in releases of vermiculite and LA-containing wastes to the environment. Much of the ore produced by the mine was transported by rail to vermiculite processing areas within and outside of Libby and insulation distributors outside of Libby. During transport, the BNSF railyard and right-of-way (ROW) may have become contaminated with LA through spillage during rail car loading and transit.

Asbestos fibers in source materials are typically not inherently hazardous, unless the asbestos is released from the source material into air where it can be inhaled (EPA 2008). If inhaled, asbestos fibers can increase the risk of developing lung cancer, mesothelioma, pleural fibrosis, and asbestosis. Potential hazards at OU6 consist of the disturbance of source materials (e.g.,

ROW soil) during rail maintenance activities or during recreational/trespassing activities, such as hiking along the railroad tracks. Thus, railroad workers that perform maintenance work within OU6 and the general public who trespass or recreate on or near the ROW have the potential to be exposed to LA during source disturbance activities, and these inhalation exposures may pose a risk of cancer and/or non-cancer effects.

The evaluation of risks to humans from exposure to asbestos is most reliably achieved by the collection of data on the level of asbestos in breathing zone air during disturbance of asbestos source materials, referred to as “activity-based sampling” (ABS) (EPA 2008). BNSF performed outdoor ABS in September 2008 (EMR Inc. 2010a, b) to measure the concentration of LA released into air during railroad maintenance activities along the OU6 rail corridor. This ABS study was designed to evaluate potential exposures to BNSF workers and the general public. The worker scenario simulated two types of railroad workers: a general laborer performing duties on the track as part of larger group of workers and workers operating machinery with an open air cab. Two types of public exposure scenarios were planned: on-looker trespassers and pedestrian trespassers; however, due to manpower limitations during the actual ABS, the two trespasser scenarios were essentially the same.

The BNSF air monitoring samples provide data representative of railroad workers performing typical maintenance activities, and for public receptors (e.g. on-lookers, trespassers) along a 30 mile stretch of OU6. All samples were analyzed for asbestos by transmission electron microscopy (TEM) utilizing International Organization for Standardization (ISO) Method 10312:1995(E) counting and recording rules (ISO 1995). However, results for these samples are limited because more than half of all air samples collected and analyzed during the original ABS study did not achieve the target analytical sensitivity (TAS)¹ of 0.001 per cubic centimeter (cc⁻¹) specified in the *Rail Maintenance Public Receptor Activity-Based Sampling and Analysis Plan* (SAP) (ENSR/AECOM 2008). The TAS specified in the SAP was derived based on a worker exposure scenario and utilizing the asbestos inhalation unit risk (IUR) (EPA 2008). More recently, the EPA has proposed new cancer and non-cancer toxicity values that are specific to LA². These are draft values that are currently undergoing review. Because the proposed LA-specific non-cancer reference concentration (RfC) is very low, the TAS needed to support reliable risk management decisions based on the RfC are much lower than those originally specified in the original SAP. Therefore, selected BNSF outdoor ABS air monitoring samples were re-analyzed to a lower TAS to support an evaluation of potential exposure and risks using the LA-specific toxicity values.

The purpose of this document is to summarize the results of these supplemental analyses.

¹ See Section 3.2.3 for more information on the calculation of analytical sensitivity.

² <http://www2.epa.gov/region8/libby-asbestos-proceedings-may-3-2011-public-meeting>

1.3 Document Organization

In addition to this introduction, this report is organized into the following sections:

Section 2 This section summarizes data management procedures and results documentation.

Section 3 This section summarizes the design of the study, and describes the data that were collected in this study, the analytical methods used for estimating the level of LA in personal air samples, as well as the data reduction methods utilized in this report.

Section 4 This section summarizes the results for data that were collected as part of this study, and presents a comparison of the TEM re-analysis results to the original TEM results.

Section 5 This section presents the results of the data quality assessment, including a summary of program audits, modifications, data verification efforts, an evaluation of quality control (QC) samples, and a data adequacy assessment.

Section 6 This section provides full citations for all analytical methods, site-related documents, and scientific publications referenced in this document.

All referenced tables and figures are provided at the end of this document. All referenced appendices are provided electronically.

2 DATA MANAGEMENT

2.1 Sample Collection, Documentation, Handling, and Custody

All samples evaluated in this study were ABS air samples previously collected by BNSF in OU6; no new samples were collected during this study. Additional sample documentation and chain of custody for the transfer of original samples to the analytical laboratory are provided in **Appendix A**. Air samples analyzed during this study were selected and documented as specified in the *OU6 Outdoor ABS Supplemental TEM Analysis Recommendations Memorandum* (CDM Smith 2013).

All selected samples were identified at the time of collection with unique sample identification (ID) numbers that included a program-specific prefix of "BA-" (e.g., BA-00011), which indicate these were air samples collected as part of the BNSF ABS investigation.

2.2 Analytical Results Recording

Standardized data entry spreadsheets (electronic data deliverables, or EDDs) have been developed specifically for the Libby project to ensure consistency between laboratories in the presentation and submittal of analytical data. In general, a unique EDD has been developed for each analytical method and each medium. Each EDD provides the analyst with a standardized laboratory bench sheet and accompanying data entry form for recording analytical data. The data entry forms contain a variety of built-in QC functions that improve the accuracy of data entry and help maintain data integrity. These spreadsheets also perform automatic computations of analytical input parameters (e.g., sensitivity, dilution factors, and concentration), thus reducing the likelihood of analyst calculation errors. The EDDs generated by the laboratories are uploaded directly into the Libby site database (see Section 2.4).

2.3 Hard Copy Data Management

No hard copy field sample data sheets (FSDSs) or field logbooks were generated as part of this re-analysis effort (because no new samples were collected). Copies of the chain of custody forms for the transfer of original samples to the analytical laboratory are included in the laboratory reports provided in **Appendix A**.

All hard copy analytical bench sheets are scanned and included in the analytical laboratory job reports. These analytical reports are submitted to the Libby laboratory coordinator (i.e., EPA's Environmental Services Assistance Team [ESAT] contractor, TechLaw, Inc.) and stored electronically. **Appendix A** of this report provides copies of all the analytical laboratory reports for TEM analyses performed as part of this study.

2.4 Electronic Data Management

Detailed information regarding electronic data management procedures and requirements can be found in the *EPA Data Management Plan for the Libby Asbestos Superfund Site* (EPA 2012a). In brief, sample and analytical electronic data are stored and maintained in the Libby Scribe project databases that are housed on a local computer located at the TechLaw office in Golden, Colorado, which is backed up daily to an external hard drive. Raw data summarized in this report were downloaded from Scribe.NET on 11/18/2013, into a Microsoft Access® database by CDM Smith. A frozen copy of this Access database is provided in **Appendix B** of this report.

Because data for the Libby project are maintained in multiple Scribe projects (e.g., analytical data are managed in annual projects, field information is managed in a project separate from the analytical information), the data have been combined into one Access database reflecting a compilation of tables from multiple Scribe projects. Any changes made to these Scribe projects since this download will not be reflected in the Access database.

3 OUTDOOR AIR RE-ANALYSIS

As discussed previously, the goal of this ABS study was to evaluate potential exposures of railroad workers and the general population (i.e., pedestrian trespassers and on-looker trespassers) to LA in air as a consequence of outdoor disturbance activities occurring during railroad maintenance along the OU6 railroad corridor. Personal air samples, stationary air samples, and soil samples were collected during the 7-day ABS event conducted from September 17 to 25, 2008.

As discussed above, prior to 2011, ABS studies were designed to meet analytical requirements based on the IUR for asbestos provided in the *Framework for Investigating Asbestos-Contaminated Superfund Sites* (EPA 2008). More recently, the EPA has provided draft LA-specific cancer and non-cancer toxicity values; the draft values are currently undergoing review. Because the proposed LA-specific RfC is very low, the TAS requirements required to support reliable risk calculations are much lower than those originally specified in the original SAP (ENSR/AECOM 2008). Rather than collect new ABS air samples, a subset of the samples previously collected during the 2008 ABS event were selected for re-analysis by TEM to achieve a better analytical sensitivity. The sample selection criteria and re-analysis methods are presented in CDM Smith (2013) and described in greater detail below.

3.1 Study Design

3.1.1 Sample Selection Criteria

Multiple selection criteria were applied in choosing which BNSF samples to re-analyze. These selection criteria are summarized below.

Types of Monitoring Samples

Experience at Libby and at other asbestos sites has demonstrated that personal air samples are more representative of breathing zone exposures and tend to have higher concentrations of LA than stationary monitor air samples, especially if the person is engaged in an activity that disturbs asbestos source materials (EPA 2007). Thus, this evaluation focuses on personal ABS air samples.

Personal air monitoring samples were collected for workers for the duration of a planned maintenance activity at each location (ENSR/AECOM 2008), which was estimated to last from two to four hours. However, because pump flow rates were reduced during the actual ABS event, the sampling event duration was increased from four to eight hours. Because the goal of this study was to obtain data that would be relevant to support estimates of exposures that could result from maintenance activities in the ROW, these samples were considered appropriate for re-analysis.

Types of Disturbance Activities

ABS air samples were selected to represent a range of potential outdoor disturbance activities, including low intensity disturbances (e.g., trespasser pedestrian) and high intensity disturbances (e.g., general laborer removing track and disturbing ballast materials).

Representativeness

The goal of the human health risk assessment is to evaluate risks based on current conditions, as well as expected future conditions (i.e., not past conditions). The outdoor ABS samples collected in 2008 were determined to be representative of exposure conditions that are reasonably expected to be present in OU6 at the time of the study (2008) and under present conditions. This conclusion is based on the fact that in general cleanup actions within OU6 were completed prior to 2008. As such, the 2008 outdoor ABS air samples are likely to be representative of conditions that could reasonably be encountered by current and future workers and the general public within OU6.

Target Analytical Sensitivity

All original ABS samples were analyzed for asbestos by TEM in accordance with ISO 10312:1995(E) counting and recording rules (ISO 1995). Because all ABS air samples collected in the 2008 study were non-detect (i.e., no asbestos structures were observed during the original analysis), it is important to be sure that the analytical sensitivity is adequate to support reliable decision-making with respect to the new LA-specific toxicity values.

The level of analytical sensitivity needed to ensure that an air sample analysis will be adequate is derived by finding the concentration of LA in air that might be of potential concern, and then ensuring that if an air sample were encountered that had a true concentration equal to that level of concern, it would be quantified with reasonable accuracy. The original TAS specified in the SAP (ENSR/AECOM 2008) was derived based on a BNSF worker exposure scenario and utilized the asbestos IUR (EPA 2008). The TAS specified in the SAP was 0.001 cc⁻¹. Although no LA structures were observed in any ABS air sample collected, more than half of all air samples did not achieve the original TAS.

A memorandum prepared by CDM Smith (CDM Smith 2013) described the process that was used to derive the revised TAS needed to support decision-making with respect to the new LA-specific toxicity values. In brief, risk-based concentrations (RBCs) were calculated for cancer and non-cancer exposures using site-specific exposure assumptions for BNSF workers, pedestrian trespassers, and on-looker trespassers. The worker scenario simulated two types of railroad workers: a laborer performing duties on the track as part of larger group of workers and a worker operating machinery with an open air cab. The pedestrian trespasser scenario was to represent potential exposures when railway maintenance activities were not occurring while the

on-looker trespasser scenario was to represent exposures in areas where maintenance activities were occurring. The TAS was then determined by dividing the lower of the RBCs (cancer or non-cancer) by the target number of structures (set equal to 3 for this evaluation³). The following table summarizes the exposure parameter assumptions used to derive the revised TAS for each exposure population of interest for OU6 and the resulting TAS:

Exposure Population	Exposure Time [ET] (hours/day)	Exposure Frequency [EF] (days/year)	Exposure Duration [ED] (years)	Revised TAS (cc ⁻¹)
Worker	8 ^(a)	60 ^(a)	50 ^(a,c)	0.0004
Pedestrian Trespasser	4 ^(a)	60 ^(b)	50 ^(a,c)	0.0009
On-looker Trespasser	2 ^(a)	60 ^(b)	15 ^(b)	0.006

^(a) As provided in the original ABS SAP (ENSR/AECOM 2008)

^(b) Assumed based on professional judgment

^(c) Assumes individual is also a Libby resident

3.1.2 Sample Candidate Selection

The selection criteria described above and in the governing SAP were used to query the Libby project databases (i.e., Scribe project databases) for candidate BNSF ABS air samples. Thirty-five candidate ABS air samples were identified. Based on the revised TAS specified in the table above, and in review of the achieved analytical sensitivities for the personal ABS air samples, supplemental TEM analysis was deemed necessary for 22 out of the 35 ABS air samples including:

- all (14) of the worker samples, and
- 8 of 14 pedestrian trespasser samples.

None of the on-looker trespasser samples were selected for supplemental TEM analysis.

Table 3-1 presents the list of selected ABS samples to be re-analyzed to achieve a lower analytical sensitivity.

³ In setting the target number of structures to 3, this ensures that there is a 95% probability that an analysis that achieves the TAS will observe at least 1 structure if the true air concentration is equal to the RBC.

3.2 Sample Re-Analysis

3.2.1 Analysis Method

The original BNSF air filter was used to prepare ten new grids for TEM analysis using the grid preparation techniques described in Section 9.3 of ISO 10312:1995(E) (ISO 1995). The resulting grids were analyzed for asbestos in basic accordance with ISO 10312 counting and recording rules, as modified by the most recent versions of Libby Laboratory Modifications⁴ LB-000016, LB-000029, LB-000066, LB-000067, and LB-000085.

All samples were examined using counting protocols for recording phase contrast microscopy-equivalent (PCME) structures only⁵ (per ISO 10312 Annex E). That is, filters were examined at a magnification of about 5,000x, and all amphibole structures (including not only LA but all other amphibole asbestos types as well) that have appropriate selective area electron diffraction (SAED) patterns and energy dispersive spectroscopy (EDS) spectra, and meet PCME counting rules were recorded on the Libby-specific TEM laboratory bench sheets. If observed, chrysotile was recorded in accordance with ISO 10312 recording procedures.

When a sample is analyzed by TEM, the analyst records the size (length, width) and mineral type of each individual asbestos structure that is observed. Mineral type is determined by inspecting SAED patterns and EDS spectra, and each structure is assigned to one of the following four categories:

LA Libby-class amphibole. Structures having an amphibole SAED pattern and an EDS elemental composition similar to the range of fiber types observed in ores from the Libby mine (Meeker *et al.* 2003). This is a solid solution series of minerals including winchite and richterite, with lower amounts of tremolite, magnesio-arfvedsonite, magnesio-riebeckite, and edenite/ferro-edenite. Depending on the valence state of iron, some minerals may also be classified as actinolite.

OA Other amphibole-type asbestos fibers. Structures having an amphibole SAED pattern and an EDS elemental composition that is not similar to fiber types from the Libby mine. Examples include crocidolite, amosite, and anthophyllite. There is presently no evidence that these fibers are associated with the Libby mine.

CH Chrysotile fibers. Structures having a serpentine SAED pattern and an elemental composition characteristic of chrysotile. There is presently no evidence that these fibers are associated with the Libby mine.

⁴ Copies of all Libby Laboratory Modifications are available in the Libby Lab eRoom.

⁵ Exposure estimates used in risk assessment are compared to toxicity values that are derived from phase contrast microscopy (PCM) analyses; thus, TEM results must be reported based on PCME air concentrations.

NAM Non-asbestos material. These may include non-asbestos mineral fibers such as gypsum, glass, or clay, and may also include various types of organic and synthetic fibers derived from carpets, hair, etc. *Recording of NAM structures was not required for this study.*

The specific preparation and analytical requirements associated with this supplemental evaluation are detailed in the *OU6 Outdoor Supplemental TEM Analysis Recommendations Memorandum* (CDM Smith 2013) and summarized in an analytical requirements summary sheet [SUPPABSOU6-0413] maintained on the Libby Lab eRoom.

3.2.2 Counting and Stopping Rules

Because of the high number of grid openings that were needed to achieve the target analytical sensitivity, all air samples were examined using counting protocols for recording PCME structures only (per ISO 10312 Annex E) as described above. PCME structures are defined as those structures having a length > 5 micrometers (μm), a width $\geq 0.25 \mu\text{m}$, and an aspect ratio (length:width) $\geq 3:1$.

Three analysis stopping rules were followed to ensure that the results for the TEM analysis of BNSF samples were adequate to support decision-making. The basis for each stopping rule was presented in the *OU6 Outdoor Supplemental TEM Analysis Recommendations Memorandum* (CDM Smith 2013). The TEM stopping rules for this study were as follows:

1. Examine a minimum of two grid openings from each of two grids.
2. Continue examining grid openings until one of the following is achieved:
 - a. The receptor-specific TAS is achieved (worker - 0.0004 cc^{-1} , pedestrian trespasser - 0.0009 cc^{-1}).
 - b. 25 PCME LA structures have been observed.
 - c. A total filter area of 10 square millimeters (mm^2) has been examined (this is approximately 1,000 grid openings).

When one of these criteria was satisfied, the TEM analyst completed the examination of the final grid opening and ended the analysis. For all samples included in this supplemental analysis, the analyst stopped when the TAS was achieved.

3.2.3 Calculation of Air Concentration

The concentration of asbestos in air, expressed as PCME structures per cubic centimeter of air (s/cc), is given by:

$$C_{\text{air}} = N \cdot S$$

where:

C_{air} = Air concentration (PCME s/cc)

N = Number of PCME asbestos structures observed

S = Analytical sensitivity (cc⁻¹)

For air, the analytical sensitivity is calculated as:

$$S = \text{EFA} / (\text{GOx} \cdot \text{Ago} \cdot V \cdot 1000 \cdot F)$$

where:

S = Analytical sensitivity (cc⁻¹)

EFA = Effective area of the filter (mm²)

GOx = Number of grid openings examined

Ago = Area of a grid opening (mm²)

V = Volume of air passed through the filter (liters [L])

1000 = Conversion factor (cc/L)

F = Fraction of primary filter deposited on secondary filter (indirect preparation only)

Note that air samples with a count of zero (and hence a concentration of zero) are reported as zero. When computing the best estimate of the mean, samples with a count of zero are evaluated as zero, not at ½ the analytical sensitivity (EPA 2008). This approach yields an unbiased estimate of the true mean that does not depend on the analytical sensitivity of the samples included in the data set.

4 RESULTS

Table 4-1 presents a summary of the detailed TEM supplemental analysis results for each selected ABS sample, as well as the original TEM results for each sample. Detailed analytical results for both TEM analyses (original and supplemental) are provided in the project database (see **Appendix B**). An interpretation of these results is provided below.

Note that an evaluation of potential exposures and human health risks based on these results is beyond the scope of this document. These results have been evaluated and presented in a *Draft Risk Calculation Memorandum for the Human Health Risk Assessment* prepared by TRC Inc. (TRC Inc. 2013) for BNSF. The risk characterization presented in this memorandum will be reviewed by the EPA and ABS results for OU6 will be evaluated as part of the site-wide human health risk assessment.

4.1 Evaluation of TEM Results

In September 2008, an ABS event occurred for the purpose of characterizing air and soil conditions due to railroad maintenance activities along the OU6 rail corridor. Personal air samples were collected representative of BNSF workers (general laborers and machine operators) and public receptors/trespassers along a 30 mile stretch of OU6 (MP 1312 to 1341). Workers engaged in a variety of soil disturbance activities, including intensive track maintenance activities (e.g., removing and replacing tracks and ballast) that were expected to result in higher airborne concentrations of LA if present. A total of 35 ABS personal air samples were collected. LA structures were not observed in any of the air samples in the original analysis of these samples; however, over half of the air samples analyzed did not achieve the original TAS (**Table 4-1**).

In 2013, 22 of the 35 personal ABS air samples were re-analyzed to achieve a lower (better) analytical sensitivity. As shown in **Table 4-1**, no LA structures were observed in any personal air sample during the re-analysis effort. The revised TAS was achieved for all 22 samples that were re-analyzed (in some cases, an even better analytical sensitivity than required was achieved).

4.2 Comparison of Original and Re-analysis PCME Air Concentrations

As noted above, there were no observed LA structures in the 35 personal air samples collected and analyzed for LA by TEM as part of the September 2008 ABS event along the OU6 rail corridor. In addition, no LA structures were observed in the supplemental TEM analyses for 22 of the original 35 samples performed in 2013, confirming the original results.

5 DATA QUALITY ASSESSMENT

Data quality assessment (DQA) is the process of reviewing existing data to establish the quality of the data and to determine how any data quality limitations may influence data interpretation (EPA 2006a,b).

Because no new field samples were collected during this study, no field quality assurance/quality control (QA/QC) activities were performed as part of this study (i.e., no field audits were conducted or field QC samples collected). The following sections describe only laboratory QA/QC procedures and overall data quality for these results.

5.1 Laboratory QA/QC

5.1.1 Laboratory Audits

Laboratory audits are conducted to evaluate laboratory personnel to ensure that samples are handled and analyzed in accord with the program-specific documents and analytical method requirements (or approved Libby laboratory modification forms) to make certain that analytical results reported are correct and consistent. All aspects of sample handling, preparation, and analysis are evaluated. If any issues are identified, laboratory personnel are notified and retrained as appropriate.

A series of laboratory audits was performed in May-September of 2012 with follow-up audits performed in 2013 to evaluate all of the Libby laboratories. Detailed audit findings for each laboratory audited in 2012 are documented in separate laboratory-specific audit reports (Shaw Environmental & Infrastructure Group [Shaw E&I] 2012a-g). No critical deficiencies were noted during the 2012 laboratory audits that would be expected to impact data quality for TEM analyses. A summarization of the findings of the 2013 follow-up audits is currently pending.

5.1.2 Laboratory QC Evaluation

The Libby-specific QC requirements for TEM analyses of asbestos are patterned after the requirements set forth by the National Voluntary Laboratory Accreditation Program (NVLAP). In brief, there are three types of laboratory-based QC analyses for TEM – laboratory blanks, recounts, and repreparations. Detailed information on the Libby-specific requirements for each type of TEM QC analysis, including the minimum frequency rates, selection procedures, acceptance criteria, and corrective actions are provided in the most recent version of Libby Laboratory Modification LB-000029.

CDM Smith performed a cursory review of two recount analyses⁶ associated with the supplemental analysis effort, which showed that the recount analysis results were consistent with the supplemental analysis results. However, laboratory QC analyses are evaluated by the EPA Quality Assurance Technical Support (QATS) contractor (CB&I) on a program-wide basis rather than on an investigation-specific basis. The rationale for this is that the number of laboratory QC samples directly related to this study is too limited to draw meaningful conclusions regarding overall data quality. A program-wide QA/QC summary report, covering all samples collected and analyzed in 2013 will provide information regarding program-wide data quality for the TEM analytical laboratories. Interpretation of the data quality is subject to change upon completion of this report.

Although the data summarized in this report were not included in the most recent QA/QC summary report (CB&I 2013) the overall conclusions of the QA/QC summary report are likely relevant to this dataset. Based on the QC data that have been collected at the Libby site and reviewed as part of CB&I (2013) report, it was concluded that:

- Blank samples (e.g., lot blanks, field blanks, preparation blanks, laboratory blanks) show that inadvertent contamination of field samples with LA or other forms of asbestos is not of significant concern, in the field or at the analytical laboratory.
- For TEM, there is generally good concordance for intra-laboratory analyses. However, there are differences in methods or procedures between analytical laboratories and corrective action may be useful in achieving better agreement and reducing discrepancies due to analytical procedure differences. In addition, increasing the frequency of inter-laboratory analyses will help identify differences as they arise over time.

5.2 Data Verification and Validation

5.2.1 Data Verification

The Libby Scribe project databases have a number of built-in QC checks to identify unexpected or unallowable data values during upload into the database. Any issues identified by these automatic upload checks were resolved by consultation with the analytical laboratory before entry of the data into the database. After entry of the data into the database, several additional data verification steps were taken to ensure the data were recorded and entered correctly.

In order to ensure that the database accurately reflects the original hard copy documentation, all data downloaded from the database were examined to identify data omissions, unexpected values, or apparent inconsistencies. In addition, 10% of all analytical results underwent a

⁶ A recount analysis examines a subset of the same grid openings that were examined during the original analysis to ensure reproducibility of the reported TEM structure counts and attributes (length, width, mineral type).

detailed verification. Asbestos data verification involves comparing the data for a sample in the database to information on the original hard copy analytical bench sheets for that sample. In addition, the sampling information for the air pump was verified (i.e., start/stop times, start/stop flow rates) to ensure that the resulting sample air volume was correct.

Appendix C presents a detailed summary of the findings of the data verification efforts for this investigation. In brief, two TEM analyses were reviewed in accordance with standard operating procedure (SOP) EPA-LIBBY-09 as part of the data verification effort. The two samples consisted of one directly prepared filter and one indirectly prepared filter. There were no critical⁷ issues identified during the TEM verification effort. One non-critical discrepancy was identified during the TEM verification, in which the incorrect lab job number was recorded on the benchsheet for the direct preparation sample.

In addition to performing a detailed TEM analysis verification effort, pump information in Scribe were reviewed to confirm the calculated sample air volume. No issues were identified.

All issues identified during the data verification effort were submitted to the analytical laboratory for resolution and rectification. All tables, figures, and appendices (including all hard copy documentation and the database [provided in **Appendix A** and **Appendix B**, respectively]) generated for this report reflect corrected data.

5.2.2 Data Validation

Unlike data verification, where the goal is to identify and correct data reporting errors, the goal of data validation is to evaluate overall data quality and to assign data qualifiers, as appropriate, to alert data users to any potential data quality issues.

Data validation is performed by the EPA QATS contractor (CB&I), with support from technical support staff that are familiar with investigation-specific data reporting, analytical methods, and investigation requirements. For the Libby project, data validation of TEM results is performed in basic accordance with Libby-specific SOPs developed based on the draft *National Functional Guidelines (NFG) for Asbestos Data Review* (EPA 2011).

The EPA QATS contractor prepares an annual summary of the program-wide assessment of QA/QC. This annual addendum provides detailed information on the validation procedures performed and provides a narrative on the quality assessment for each type of analysis (e.g., TEM), including the data qualifiers assigned and the reason(s) for these qualifiers to denote when results do not meet acceptance criteria. This annual summary details any deficiencies, required corrective actions, and makes recommendations for changes to the QA/QC program to address any data quality issues.

⁷ A critical discrepancy is defined as an issue that could influence the reported sample concentration or sample identification information.

The validation of data analyzed in 2013 (including the OU6 supplemental TEM analyses) will be included in the next program-wide QA/QC summary report. The current report completed in November 2013 covers samples collected and analyzed in 2010-2012 (CB&I 2013). Interpretation of the data quality is subject to change upon completion of the report covering samples analyzed in 2013. However, changes are not anticipated to be significant since fewer than 0.5% of the results were flagged as a result of the validation of samples collected and analyzed in 2010-2012.

5.3 Data Adequacy Evaluation

A comparison of the data collected with the data quality objectives (DQOs) as summarized in the governing SAP (ENSR/AECOM 2008) or governing memorandum (CDM Smith 2013) is presented below.

5.3.1 Spatial and Temporal Representativeness

The spatial and temporal goals of this study were to collect data within OU6 that would be representative of current and future conditions that BNSF workers and the general public could potentially encounter within OU6. The samples selected for re-analysis as part of this study were originally collected in various locations within OU6 in September 2008 (**Figure 1-1**), which are considered to be representative of current (and future) conditions within OU6. Sampling locations sampled in 2008 were based on the planned track maintenance areas for the day and included six areas west of Libby spanning the length of OU6 starting about 8 miles west of Libby and continuing for about 20 miles (MP 1329.5, 1331, 1331.5, 1337, 1339.5, 1341). In addition one area about 7.5 miles southeast of Libby (MP 1312) was sampled. Thus, this study accomplished the spatial and temporal objectives set forth in the governing SAP.

5.3.2 Sample Completeness

Completeness is defined as the fraction of samples that were planned that were successfully completed and analyzed. As described previously, a total of 22 samples were selected for re-analysis by TEM in this study. All 22 samples were able to be successfully analyzed and achieved the revised TAS (or better). Thus, sample completeness was 100%. The available re-analysis data along with the results for original analyses are deemed adequate and considered sufficient to characterize disturbance activities for the purposes of supporting exposure estimates for OU6 in the site-wide human health risk assessment.

5.3.3 Confirmation of Analysis Stopping Rules

All supplemental TEM analyses were performed in accordance with the analytical methods specified in the governing memorandum (see Section 3.2.2 for a review of these requirements). All 22 completed analyses were stopped upon achieving the specified TAS, one of the three

specified stopping rules (see Section 3.2.2 and **Appendix C, Attachment 1A**). The revised TAS of 0.00040 cc⁻¹ (or better) was achieved for the 14 worker samples re-analyzed. The revised TAS of 0.00090 cc⁻¹ (or better) was achieved for the 8 pedestrian trespassers/on-looker samples re-analyzed. Therefore, the TEM results for all the air re-analyses met the analytical requirements set forth in the governing memorandum.

5.3.4 Filter Loading

The TEM analysis of filters generated from air samples examines only a small portion of the total filter. For the purposes of computing concentration in the associated sample, it is assumed that the filter is evenly loaded. The assessment of filter loading evenness is evaluated using a Chi-square (CHISQ) test, as described in ISO 10312 Annex F2 (ISO 1995). If a filter fails the CHISQ test for evenness, the reported result may not be representative of the true concentration in the sample, and the results should be given low confidence. An evaluation of filter loading for the ABS air samples from this study showed that, since no structures were observed in any analysis, all filters passed the CHISQ test for evenness. Thus, it is concluded that uneven filter loading is not of significant concern for the air samples analyzed in this study.

5.3.5 Air Filter Preparation Methods

For four of the selected ABS air samples that were analyzed by TEM, the filter required the use of an indirect preparation method due to high particulate loading on the filter (see **Table 4-1**). These samples were all worker ABS air samples collected during high-intensity disturbance activities.

For chrysotile asbestos, indirect preparation can increase structure counts up to 1,000-fold due to dispersion of bundles and clusters (Hwang and Wang 1983; Chesson and Hatfield 1990; HEI-AR 1991; Breyse 1991). For amphibole asbestos, the effects of indirect preparation are generally much smaller (Bishop *et al.* 1978; Sahle and Laszlo, 1996; Harris 2009). A Libby-specific evaluation of the effect of indirect preparation on reported LA air concentrations shows that indirect preparation does increase reported concentrations, but the ratio of the indirect preparation concentration to the direct preparation concentration is usually within a factor of about 2-3 for PCME LA (Berry *et al.* 2014, Goldade & O'Brien 2014). This relative insensitivity of PCME LA concentration estimates to preparation method is likely due to the fact that complex LA structures (e.g., bundles, compact clusters) that might be subject to dispersal during an indirect preparation are rarely present in most Libby air samples.

Because no asbestos fibers were observed in any of the air samples, the analysis of samples for LA using an indirect preparation method is not a source of uncertainty.

5.4 Conclusions

Based on a review of each of these data quality metrics, it is concluded that the TEM results for the OU6 ABS samples re-analyzed as part of this study are of adequate quality to support their intended use.

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**Data Summary Report:
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**Libby Asbestos Superfund Site, Operable Unit 6
Libby, Montana**

TABLES

Table 3-1
Summary of Selected ABS Samples for Supplemental TEM Analysis

Receptor	Sample ID	Preparation Method	Target Sensitivity (cc ⁻¹)	Achieved Sensitivity (cc ⁻¹)	Air Sample Volume (liters)	F-Factor	EFA (mm ²)	Area of GO (mm ²)	Number of GOs Analyzed
Railroad Worker	BA-00011	Direct	0.0024	0.00233	706	1	385	0.013	18
	BA-00012	Direct	0.0024	0.00239	687	1	385	0.013	18
	BA-00021	Direct	0.0024	0.00231	988	1	385	0.013	13
	BA-00022	Direct	0.0024	0.00224	1016	1	385	0.013	13
	BA-00029	Direct	0.0024	0.00235	1145	1	385	0.013	11
	BA-00030	Direct	0.0024	0.00235	1145	1	385	0.013	11
	BA-00047	Direct	0.0024	0.00233	1154	1	385	0.013	11
	BA-00048	Direct	0.0024	0.00231	1165	1	385	0.013	11
	BA-00058	Direct	0.0024	0.00232	510	1	385	0.013	25
	BA-00059	Direct	0.0024	0.00236	501	1	385	0.013	25
	BA-00001	Indirect	0.0024	0.00211	1344	0.25	360	0.013	35
	BA-00002	Indirect	0.0024	0.00426	1333	0.125	360	0.013	39
	BA-00037	Indirect	0.0024	0.00769	739	0.125	360	0.013	39
	BA-00038	Indirect	0.0024	0.00319	890	0.25	360	0.013	39
Trespasser Pedestrian	BA-00032	Direct	0.0024	0.000974	780	1	385	0.013	16
	BA-00033	Direct	0.0024	0.00115	658	1	385	0.013	19
	BA-00040	Direct	0.0024	0.00237	780	1	385	0.013	16
	BA-00041	Direct	0.0024	0.00229	718	1	385	0.013	18
	BA-00050	Direct	0.0024	0.0023	806	1	385	0.013	16
	BA-00051	Direct	0.0024	0.0022	791	1	385	0.013	17
	BA-00061	Direct	0.0024	0.00235	630	1	385	0.013	20
	BA-00062	Direct	0.0024	0.00234	602	1	385	0.013	21

EFA = Effective filter area

GO = Grid opening

cc⁻¹ = per cubic centimeter

mm² = square millimeters

Table 4-1
Summary of TEM Results for OU6 ABS Samples Selected for Supplemental Analysis

Sample Information			Original Analysis								Supplemental Analysis				Pooled Results [a]		
Sample Type	Sample ID	Air Sample Volume (liters)	Preparation Method	F-Factor	EFA (mm ²)	Area of GO (mm ²)	Number of GOs Analyzed	Achieved Sensitivity (cc ⁻¹)	Number of PCME LA Structures	PCME LA Air Conc. (s/cc)	Number of GOs Analyzed	Achieved Sensitivity (cc ⁻¹)	Number of PCME LA Structures	PCME LA Air Conc. (s/cc)	Achieved Sensitivity (cc ⁻¹)	Number of PCME LA Structures	PCME LA Air Conc. (s/cc)
Railroad Worker	BA-00011	706	Direct	1	385	0.013	18	0.0023	0	0	105	0.00040	0	0	0.00034	0	0
	BA-00012	687	Direct	1	385	0.013	18	0.0024	0	0	110	0.00039	0	0	0.00034	0	0
	BA-00021	988	Direct	1	385	0.013	13	0.0023	0	0	75	0.00040	0	0	0.00034	0	0
	BA-00022	1016	Direct	1	385	0.013	13	0.0022	0	0	73	0.00040	0	0	0.00034	0	0
	BA-00029	1145	Direct	1	385	0.013	11	0.0024	0	0	65	0.00040	0	0	0.00034	0	0
	BA-00030	1145	Direct	1	385	0.013	11	0.0024	0	0	65	0.00040	0	0	0.00034	0	0
	BA-00047	1154	Direct	1	385	0.013	11	0.0023	0	0	65	0.00039	0	0	0.00034	0	0
	BA-00048	1165	Direct	1	385	0.013	11	0.0023	0	0	65	0.00039	0	0	0.00033	0	0
	BA-00058	510	Direct	1	385	0.013	25	0.0023	0	0	146	0.00040	0	0	0.00034	0	0
	BA-00059	501	Direct	1	385	0.013	25	0.0024	0	0	148	0.00040	0	0	0.00034	0	0
	BA-00001	1344	Indirect	0.25	360	0.013	35	0.0021	0	0	210	0.00039	0	0	0.00033	0	0
	BA-00002	1333	Indirect	0.125	360	0.013	39	0.0043	0	0	420	0.00040	0	0	0.00036	0	0
	BA-00037	739	Indirect	0.125	360	0.013	39	0.0077	0	0	760	0.00039	0	0	0.00038	0	0
	BA-00038	890	Indirect	0.25	360	0.013	39	0.0032	0	0	320	0.00039	0	0	0.00035	0	0
Trespasser Pedestrian	BA-00032	780	Direct	1	385	0.013	16	0.0010	0	0	50	0.00076	0	0	0.00043	0	0
	BA-00033	658	Direct	1	385	0.013	19	0.0012	0	0	55	0.00082	0	0	0.00048	0	0
	BA-00040	780	Direct	1	385	0.013	16	0.0024	0	0	55	0.00069	0	0	0.00053	0	0
	BA-00041	718	Direct	1	385	0.013	18	0.0023	0	0	50	0.00082	0	0	0.00061	0	0
	BA-00050	806	Direct	1	385	0.013	16	0.0023	0	0	50	0.00073	0	0	0.00056	0	0
	BA-00051	791	Direct	1	385	0.013	17	0.0022	0	0	50	0.00075	0	0	0.00056	0	0
	BA-00061	630	Direct	1	385	0.013	20	0.0024	0	0	53	0.00089	0	0	0.00064	0	0
	BA-00062	602	Direct	1	385	0.013	21	0.0023	0	0	60	0.00082	0	0	0.00061	0	0

EFA = Effective filter area

cc⁻¹ = per cubic centimeter

GO = Grid opening

ID = Identification number

LA = Libby amphibole

mm² = square millimeters

PCME = Phase contrast microscopy-equivalent

s/cc = structures per cubic centimeter

[a] Pooled concentration is calculated as: $C_{air} = \sum \text{Number of PCME LA Structures} / \sum (1/\text{Achieved Sensitivity})$

**Data Summary Report:
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Air Re-analysis Results**

**Libby Asbestos Superfund Site, Operable Unit 6
Libby, Montana**

FIGURES



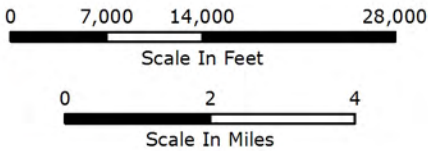
Figure Source:
Figure 2
OU6 Overview Map Showing
Commonly Referenced Features

Activity Based Sampling
Summary Report
--
Public Receptors

BNSF Kootenai River Sub
Libby, Montana

- Legend**
- Approximate Milepost Locations
 - Rail Sidings
 - BNSF Railway
 - BNSF Yard

Figure 1-1
OU6 Boundaries and
ABS Locations



Project Number: 5539-140
Date: March 8, 2010
Drafted By: KLA
Reviewed By: SJC
Reference: 2006 Lincoln Aerial



11 E. Superior St. Suite #260
Duluth, MN 55802
Phone: 218.625.2332
Fax: 218.625.2337

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Appendices

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Libby, Montana**

**Appendix A
Analytical Laboratory Reports**

July 11, 2013

Mr. Doug Kent
TechLaw, Inc.
ESAT Region 8
16194 W. 45th Drive
Golden, CO 80403
303-312-7725

RE: SDG Narrative – TEM Analysis by ISO 10312
EMSL Analytical, Inc. Laboratory Order ID: 271300244

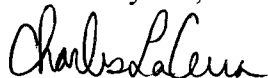
Dear Mr. Kent:

Fourteen samples were received by the Libby Lab on May 21, 2013 and signed for by the sample receiving clerk. The samples were assigned to an internal EMSL laboratory order ID number of 271300244. Each sample was assigned a unique, sequential laboratory ID number and the job was entered into the Laboratory Information Management System (LIMS). The laboratory ID numbers and the login information are summarized on the EMSL Internal Chain of Custody. Sample condition and signatures are recorded on the original Chain of Custody 0412-003 submitted by TechLaw, Inc.

These samples were analyzed in accordance with TEM ISO 10312: 1995 Ambient Air Determination of Asbestos Fibres Direct Transfer Transmission Electron Microscopy, as modified by lab modifications specific to the Libby Project.

Results were e-mailed to the Libby Distribution Group and uploaded to the FTP site beginning on July 1, 2013. If you have any questions or require additional information, please do not hesitate to contact me at 856-303-2540.

Sincerely,
EMSL Analytical, Inc.



Charles LaCerra
Special Projects Manager

Chain of Custody Record

271300244

Samples from:

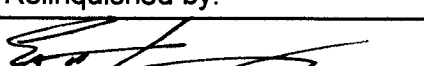
Send to:

BNSF/Kennedy Jenks Consult	TechLaw/ESAT Region 8	Chain of Custody Number	0412-003
4745 1st Avenue South	303 N. 3rd Street	Number of Samples	14
Duluth, MN 55803	Troy, MT 59935	Analytical Summary Sheet	SUPPABSOU6-0413 Rev.0
	Attention: Andrea Wandler (406) 295-9151	Date Shipped	

Special Instructions: Samples resubmitted as per EPA request for reanalysis.

Samples collected during worker receptor ABS (September, 2008)

Sample ID	Tag	Sample Date	Matrix	Volume (L)	Filter Pore Size (um)	Low Volume Sample ID	Analysis Requested	Turnaround Time (days)	Media Code	Comments
BA-00001	ALI	09/17/08	Air	1344	0.8	--	TEMP 180	30	A	
BA-00002	ALI	09/17/08	Air	1333	0.8	--			A	
BA-00011	ALI	09/18/09	Air	706	0.8	--			A	
BA-00012	ALI	09/18/08	Air	687	0.8	--			A	
BA-00021	ALI	09/19/08	Air	988	0.8	--			A	
BA-00022	ALI	09/19/08	Air	1016	0.8	--			A	
BA-00029	ALI	09/22/08	Air	1145	0.8	--			A	
BA-00030	ALI	09/22/08	Air	1145	0.8	--			A	
BA-00037	ALI	09/23/08	Air	739	0.8	--			A	
BA-00038	ALI	09/23/08	Air	890	0.8	--			A	
BA-00047	ALI	9/24/2008	Air	1154	0.8	--			A	
BA-00048	ALI	9/24/2008	Air	1165	0.8	--			A	
BA-00058	ALI	9/25/2008	Air	510	0.8	--			A	
BA-00059	ALI	9/25/2008	Air	501	0.8	--			A	
	ALI								A	

Relinquished by:	Date:	Time:	Received by:	Date:	Sample Condition:
	4/19/13	1400	Andrea Wandler	04/25/13	Complete
Relinquished by:	Date:	Time:	Received by:	Date:	Sample Condition:
G. Brown TechLaw	05/21/13	12:41	Drew Brown EMS	05/21/13	OK ACCEPT

INTERNAL CHAIN OF CUSTODY

6/19/2013 10:23:13 AM

Order ID: 271300244

Attn: Doug Kent
TechLaw, Inc.
ESAT Region 8
16194 W. 45th Drive
Golden, CO 80403

Customer ID: TECH25
Customer PO:
Received: 05/21/13 12:41 PM

Fax: Phone: (303) 312-7725
Project: 0412-003
BNSF/Kennedy Jenks Samples
Samples collected 9./17, 18, 19, 22, 23, 24, 25./2008

EMSL Order: 271300244
EMSL Proj ID: Libby
Cust COC ID

Test: TEM ISO 10312

Matrix Air

TAT: 4 weeks

Qty: 14

Acct Sts: N30

Slsprsn: rdemalo

Logged: kcolberg

Date: 5/21/2013

Inter-Lab Sample Transfer

Samples Relinquished: _____ Date _____
Samples Received: _____ Date _____
Package Mailed to Cinnaminson: KC Date 7/8/13
Method of Delivery: FedEx
Includes: (Circle)
☒ Benchsheets ☐ Sample Slides ☐ Sample filters
☐ Micrographs ☐ GridBox ☐ Other _____

Sample Condition: ☒ Acceptable
☐ Unacceptable

Comments

Initial Prep (Initials/Lab): EJWP/DB Date: 4/15/2009/6/19/13
Filter Prep (Initials/Lab): EJWP/DB Date: 4/15/2009/6/18/13
Grid Prep (Initials/Lab): DB Date: 6/18/13

Final Package Received: UMS Date: 7/11/13

For Special Projects Use Only:

QC Selection: _____ Date: _____
Date Package Review: _____ Date: _____
Date Package Mailed: _____ Date: _____

Special Instructions

Order ID	Lab Sample #	Cust. Sample #	Location	Due Date
271300244	271300244-0001	BA-00001 (PS) ESMP 6/19/13		7/2/2013 5:00:00 PM
271300244	271300244-0002	BA-00002		7/2/2013 5:00:00 PM
271300244	271300244-0003	BA-00011		7/2/2013 5:00:00 PM
271300244	271300244-0004	BA-00012 (PS)		7/2/2013 5:00:00 PM
271300244	271300244-0005	BA-00021		7/2/2013 5:00:00 PM
271300244	271300244-0006	BA-00022		7/2/2013 5:00:00 PM
271300244	271300244-0007	BA-00029		7/2/2013 5:00:00 PM
271300244	271300244-0008	BA-00030		7/2/2013 5:00:00 PM

2713-LIB-56 (A-T), 2713-LIB-57 (A-I)

INTERNAL CHAIN OF CUSTODY

6/19/2013 10:23:14 AM

Order ID: 271300244

Attn: Doug Kent
TechLaw, Inc.
ESAT Region 8
16194 W. 45th Drive
Golden, CO 80403

Customer ID: TECH25
Customer PO:
Received: 05/21/13 12:41 PM

Fax: Phone: (303) 312-7725

Project: **0412-003**
BNSF/Kennedy Jenks Samples
Samples collected 9./17, 18, 19, 22, 23, 24, 25./2008

EMSL Order: 271300244
EMSL Proj ID: Libby
Cust COC ID

<u>Test:</u>	TEM ISO 10312	<u>Matrix</u>	Air	<u>TAT:</u>	4 weeks	<u>Qty:</u>	14
271300244	271300244-0009	BA-00037				7/2/2013 5:00:00 PM	
271300244	271300244-0010	BA-00038				7/2/2013 5:00:00 PM	
271300244	271300244-0011	BA-00047				7/2/2013 5:00:00 PM	
271300244	271300244-0012	BA-00048				7/2/2013 5:00:00 PM	
271300244	271300244-0013	BA-00058				7/2/2013 5:00:00 PM	
271300244	271300244-0014	BA-00059				7/2/2013 5:00:00 PM	

LIBBY

TEM Asbestos Structure Count -- ISO 10312

EPA Sample Number BA-00001
Tag AL1
Status ANALYZED
Lab QC Type NOT QC
Lab Sample Number 271300244-0001
Matrix Air
Category Field
Prep Indirect - Ashed
Analysis Method TEM-ISO
Est. Particulate Loading 12%

PARAMETERS

Effective filter area 360.0 mm2
F factor 2.50E-01
Number of Grid Openings (amphibole) 210
Number of Grid Openings (chrysotile) 210
Grid opening area 0.013 mm2
Volume (L) or Area (cm2) 1344 L
Sensitivity (amphibole) 3.92E-04 s/cc
Sensitivity (chrysotile) 3.92E-04 s/cc
Area Examined (amphibole) 2.730 mm2
Area Examined (chrysotile) 2.730 mm2

Magnification: LOW

Recording Rules:

Min AR	Min length (um)	Min width (um)
3:1	5	0.25

Stopping Rules:

Target Sens.	Max AE (mm ²)	Max N LA
0.0004	10.000	25

COUNTS (based on countable structures only)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0	0	0	0

CONCENTRATION (s/cc)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total: Length > 0.5 um, Aspect Ratio >= 3:1

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

Chi-sq test for filter loading --

p value: 1.0E+00

interpretation: OK

FILE NAME: 0412-003_BA-00001_271300244-0001_TEM-ISO_AR_06-19-13_IA_NotQC_C0.xlsm

FILE TYPE: Original

LIBBY

TEM Asbestos Structure Count

Laboratory ID:	EMSL27		EPA Sample Number:	BA-00001	Tag	AL1	
Instrument ID	OL 100 CX II (27-2)		Matrix	Air			
Voltage (KV)	100		Air volume (L), dust sample area (cm ²), or dustfall container area (cm ²):	1344			
Magnification (do not include X)	4,800	LOW	Date received by lab	5/21/2013			
Grid opening area (mm ²)	0.0130		Lab Job Number:	271300244			
Scale: 1L =	1.000		Lab Sample Number:	271300244-0001			
Scale: 1D =	1.000		Number of grids prepared	10			
Primary filter area (mm ²)	385.0		Prepared by (e.g., M. Smith)	E. Wyatt-Pescador			
Secondary Filter Area (mm ²)	360.0		Preparation date	4/15/2009			
Category	Field		EPA COC Number	0412-003			
Filter Status	ANALYZED		Estimated Particulate Loading (%)	12%			

Analyzed by (e.g., M. Smith)	E. Wyatt-Pescador	
Analysis date	6/19/2013	
Prep	Indirect - Ashed	
If sample type = air, is there loose material or debris in the bowl?	No	
Analysis Method	TEM-ISO	
Analysis Method SOP	ISO 10312	
Grid storage location	2713-LIB-56	
Archive filter(s) storage location	ESAT Archive	
Enter the appropriate data in the cells to the right to calculate the F-factor >>>>>		
F- factor	0.25	
Lab QC Type	NOT QC	

Recording Rules:

3:1	Minimum Aspect Ratio
5.00	Minimum Length (um)
0.25	Minimum Width (um)

Stopping Rules:

0.00040	Target Sensitivity
207	GOs required to reach target
10.000	Maximum Area Examined (mm ²)
770	GOs required to reach max area
25	Maximum # of Structures
207	Estimated # of GOs required

F-factor Calculation:

Indirect Prep Inputs

0.50	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
100	First resuspension volume or rinsate volume (mL)
50	Volume applied to secondary filter (mL) or used for serial dilution

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

0.25	F-factor
------	----------

Grid opening traverse direction:	V
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Supplemental Air Analysis

☐ Check box if supplemental analysis

	Achieved sensitivity (cc ⁻¹) from the original analysis
--	---

Note: When the box is checked above, the est. # of GOs required that is calculated will automatically take into account the GOs examined during the original analysis.

COMMENTS

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LIBBY
TEM Asbestos Structure Count

0412-003_BA-00001_271300244-0001_TEM-ISO_AR_06-19-13_IA_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00001
LAB SAMPLE ID: 271300244-0001

Matrix: Air
Analysis Method: TEM-ISO

Prep: Indirect - Ashed
QC Type: NotQC

ERROR CHECK
OK - No errors found

Data Entry by (e.g., M. Smith)

B. Gallagher

QA by (e.g., M. Smith)

M. Smollock

Data Entry date: 6/21/2013

QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A1	B1	ND																
A1	B3	ND																
A1	B5	ND																
A1	B7	ND																
A1	B9	ND																
A1	C2	ND																
A1	C4	ND																
A1	C6	ND																
A1	C8	ND																
A1	C10	ND																
A1	D1	ND																
A1	D3	ND																
A1	D5	ND																
A1	D7	ND																
A1	D9	ND																
A1	E2	ND																
A1	E4	ND																
A1	E6	ND																
A1	E8	ND																
A1	E10	ND																
A1	F1	ND																
A1	F3	ND																
A1	F5	ND																
A1	F7	ND																
A1	F9	ND																
A1	G2	ND																
A1	G4	ND																
A1	G6	ND																
A1	G8	ND																
A1	G10	ND																
A1	H1	ND																
A1	H3	ND																
A1	H5	ND																
A1	H7	ND																
A1	H9	ND																
A1	I2	ND																
A1	I4	ND																
A1	I6	ND																
A1	I8	ND																
A1	I10	ND																
A1	J1	ND																
A1	J3	ND																
A1	J5	ND																
A1	J7	ND																
A1	J9	ND																
A3	A2	ND																
A3	A4	ND																
A3	A6	ND																
A3	A8	ND																
A3	A10	ND																
A3	B1	ND																
A3	B3	ND																
A3	B5	ND																
A3	B7	ND																
A3	B9	ND																
A3	C2	ND																
A3	C4	ND																
A3	C6	ND																
A3	C8	ND																
A3	C10	ND																
A3	D1	ND																
A3	D3	ND																
A3	D5	ND																
A3	D7	ND																
A3	D9	ND																
A3	E2	ND																
A3	E4	ND																
A3	E6	ND																
A3	E8	ND																
A3	E10	ND																
A3	F1	ND																
A3	F3	ND																
A3	F5	ND																
A3	F7	ND																
A3	F9	ND																
A3	G2	ND																
A3	G4	ND																
A3	G6	ND																
A3	G8	ND																
A3	G10	ND																
A3	H1	ND																
A3	H3	ND																
A3	H5	ND																

LIBBY
TEM Asbestos Structure Count

0412-003_BA-00001_271300244-0001_TEM-ISO_AR_06-19-13_IA_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00001
 LAB SAMPLE ID: 271300244-0001

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Indirect - Ashed
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/21/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A3	H7	ND																
A3	H9	ND																
A3	I2	ND																
A3	I4	ND																
A3	I6	ND																
A3	I8	ND																
A3	I10	ND																
A3	J1	ND																
A3	J3	ND																
A3	J5	ND																
A3	J7	ND																
A3	J9	ND																
A5	A1	ND																
A5	A2	ND																
A5	A3	ND																
A5	A4	ND																
A5	A5	ND																
A5	A6	ND																
A5	A7	ND																
A5	A8	ND																
A5	A9	ND																
A5	A10	ND																
A5	B1	ND																
A5	B2	ND																
A5	B3	ND																
A5	B4	ND																
A5	B5	ND																
A5	B6	ND																
A5	B7	ND																
A5	B8	ND																
A5	B9	ND																
A5	B10	ND																
A5	C1	ND																
A5	C2	ND																
A5	C3	ND																
A5	C4	ND																
A5	C5	ND																
A5	C6	ND																
A5	C7	ND																
A5	C8	ND																
A5	C9	ND																
A5	C10	ND																
A5	D1	ND																
A5	D2	ND																
A5	D3	ND																
A5	D4	ND																
A5	D5	ND																
A5	D6	ND																
A5	D7	ND																
A5	D8	ND																
A5	D9	ND																
A5	D10	ND																
A5	E1	ND																
A5	E2	ND																
A5	E3	ND																
A5	E4	ND																
A5	E5	ND																
A5	E6	ND																
A5	E7	ND																
A5	E8	ND																
A5	E9	ND																
A5	E10	ND																
A5	F1	ND																
A5	F2	ND																
A5	F3	ND																
A5	F4	ND																
A5	F5	ND																
A5	F6	ND																
A5	F7	ND																
A5	F8	ND																
A5	F9	ND																
A5	F10	ND																
A5	G1	ND																
A5	G2	ND																
A5	G3	ND																
A5	G4	ND																
A5	G5	ND																
A5	G6	ND																
A5	G7	ND																
A5	G8	ND																
A5	G9	ND																
A5	G10	ND																
A5	H1	ND																

LIBBY
TEM Asbestos Structure Count

0412-003_BA-00001_271300244-0001_TEM-ISO_AR_06-19-13_IA_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00001
 LAB SAMPLE ID: 271300244-0001

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Indirect - Ashed
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/21/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A5	H2	ND																
A5	H3	ND																
A5	H4	ND																
A5	H5	ND																
A5	H6	ND																
A5	H7	ND																
A5	H8	ND																
A5	H9	ND																
A5	H10	ND																
A5	I1	ND																
A5	I2	ND																
A5	I3	ND																
A5	I4	ND																
A5	I5	ND																
A5	I6	ND																
A5	I7	ND																
A5	I8	ND																
A5	I9	ND																
A5	I10	ND																
A5	J1	ND																
A5	J2	ND																
A5	J3	ND																
A5	J4	ND																
A5	J5	ND																
A5	J6	ND																
A5	J7	ND																
A5	J8	ND																
A5	J9	ND																
A5	J10	ND																
A7	A1	ND																
A7	A2	ND																
A7	A3	ND																
A7	A4	ND																
A7	A5	ND																
A7	A6	ND																
A7	A7	ND																
A7	A8	ND																
A7	A9	ND																
A7	A10	ND																
A7	B1	ND																
A7	B2	ND																
A7	B3	ND																
A7	B4	ND																
A7	B5	ND																

LIBBY

TEM Asbestos Structure Count -- ISO 10312

EPA Sample Number BA-00002
Tag AL1
Status ANALYZED
Lab QC Type NOT QC
Lab Sample Number 271300244-0002
Matrix Air
Category Field
Prep Indirect - Ashed
Analysis Method TEM-ISO
Est. Particulate Loading 5%

PARAMETERS

Effective filter area 360.0 mm2
F factor 1.25E-01
Number of Grid Openings (amphibole) 420
Number of Grid Openings (chrysotile) 420
Grid opening area 0.013 mm2
Volume (L) or Area (cm2) 1333 L
Sensitivity (amphibole) 3.96E-04 s/cc
Sensitivity (chrysotile) 3.96E-04 s/cc
Area Examined (amphibole) 5.460 mm2
Area Examined (chrysotile) 5.460 mm2

Magnification: LOW

Recording Rules:

Min AR	Min length (um)	Min width (um)
3:1	5	0.25

Stopping Rules:

Target Sens.	Max AE (mm ²)	Max N LA
0.0004	10.000	25

COUNTS (based on countable structures only)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0	0	0	0

CONCENTRATION (s/cc)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total: Length > 0.5 um, Aspect Ratio >= 3:1

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

Chi-sq test for filter loading --

p value: 1.0E+00

interpretation: OK

LIBBY

TEM Asbestos Structure Count

Laboratory ID:	EMSL27		EPA Sample Number:	BA-00002	Tag	ALI	
Instrument ID	OL 100 CX II (27-2)		Matrix	Air			
Voltage (KV)	100		Air volume (L), dust sample area (cm ²), or dustfall container area (cm ²):	1333			
Magnification (do not include X)	4,800	LOW	Date received by lab	5/21/2013			
Grid opening area (mm ²)	0.0130		Lab Job Number:	271300244			
Scale: 1L =	1.000		Lab Sample Number:	271300244-0002			
Scale: 1D =	1.000		Number of grids prepared	10			
Primary filter area (mm ²)	385.0		Prepared by (e.g., M. Smith)	E. Wyatt-Pescador			
Secondary Filter Area (mm ²)	360.0		Preparation date	4/15/2009			
Category	Field		EPA COC Number	0412-003			
Filter Status	ANALYZED		Estimated Particulate Loading (%)	5%			

Analyzed by (e.g., M. Smith)	E. Wyatt-Pescador
Analysis date	6/19/2013
Prep	Indirect - Ashed
If sample type = air, is there loose material or debris in the cowl?	No
Analysis Method	TEM-ISO
Analysis Method SOP	ISO 10312
Grid storage location	2713-LIB-56
Archive filter(s) storage location	ESAT Archive
Enter the appropriate data in the cells to the right to calculate the F-factor >>>>>	
F-factor	0.125
Lab QC Type	NOT QC

Recording Rules:

3:1	Minimum Aspect Ratio
5.00	Minimum Length (um)
0.25	Minimum Width (um)

Stopping Rules:

0.00040	Target Sensitivity
416	GOs required to reach target
10.000	Maximum Area Examined (mm ²)
770	GOs required to reach max area
25	Maximum # of Structures
416	Estimated # of GOs required

F-factor Calculation:

Indirect Prep Inputs

0.50	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
100	First resuspension volume or rinsate volume (mL)
25	Volume applied to secondary filter (mL) or used for serial dilution

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

0.125 F-factor

Grid opening traverse direction:

V

Supplemental Air Analysis

☐ Check box if supplemental analysis

Achieved sensitivity (cc⁻¹) from the original analysis

Note: When the box is checked above, the est. # of GOs required that is calculated will automatically take into account the GOs examined during the original analysis.

COMMENTS

LIBBY
TEM Asbestos Structure Count

0412-003_BA-00002_271300244-0002_TEM-ISO_AR_06-19-13_IA_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00002
 LAB SAMPLE ID: 271300244-0002

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Indirect - Ashed
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/21/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
C1	A1	ND																
C1	A2	ND																
C1	A3	ND																
C1	A4	ND																
C1	A5	ND																
C1	A6	ND																
C1	A7	ND																
C1	A8	ND																
C1	A9	ND																
C1	A10	ND																
C1	B1	ND																
C1	B2	ND																
C1	B3	ND																
C1	B4	ND																
C1	B5	ND																
C1	B6	ND																
C1	B7	ND																
C1	B8	ND																
C1	B9	ND																
C1	B10	ND																
C1	C1	ND																
C1	C2	ND																
C1	C3	ND																
C1	C4	ND																
C1	C5	ND																
C1	C6	ND																
C1	C7	ND																
C1	C8	ND																
C1	C9	ND																
C1	C10	ND																
C1	D1	ND																
C1	D2	ND																
C1	D3	ND																
C1	D4	ND																
C1	D5	ND																
C1	D6	ND																
C1	D7	ND																
C1	D8	ND																
C1	D9	ND																
C1	D10	ND																
C1	E1	ND																
C1	E2	ND																
C1	E3	ND																
C1	E4	ND																
C1	E5	ND																
C1	E6	ND																
C1	E7	ND																
C1	E8	ND																
C1	E9	ND																
C1	E10	ND																
C1	F1	ND																
C1	F2	ND																
C1	F3	ND																
C1	F4	ND																
C1	F5	ND																
C1	F6	ND																
C1	F7	ND																
C1	F8	ND																
C1	F9	ND																
C1	F10	ND																
C1	G1	ND																
C1	G2	ND																
C1	G3	ND																
C1	G4	ND																
C1	G5	ND																
C1	G6	ND																
C1	G7	ND																
C1	G8	ND																
C1	G9	ND																
C1	G10	ND																
C1	H1	ND																
C1	H2	ND																
C1	H3	ND																
C1	H4	ND																
C1	H5	ND																
C1	H6	ND																
C1	H7	ND																
C1	H8	ND																
C1	H9	ND																
C1	H10	ND																
C1	I1	ND																
C1	I2	ND																
C1	I3	ND																

LIBBY
TEM Asbestos Structure Count

0412-003_BA-00002_271300244-0002_TEM-ISO_AR_06-19-13_IA_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00002
 LAB SAMPLE ID: 271300244-0002

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Indirect - Ashed
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/21/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
C1	I4	ND																
C1	I5	ND																
C1	I6	ND																
C1	I7	ND																
C1	I8	ND																
C1	I9	ND																
C1	I10	ND																
C1	J1	ND																
C1	J2	ND																
C1	J3	ND																
C1	J4	ND																
C1	J5	ND																
C1	J6	ND																
C1	J7	ND																
C1	J8	ND																
C1	J9	ND																
C1	J10	ND																
C3	A1	ND																
C3	A2	ND																
C3	A3	ND																
C3	A4	ND																
C3	A5	ND																
C3	A6	ND																
C3	A7	ND																
C3	A8	ND																
C3	A9	ND																
C3	A10	ND																
C3	B1	ND																
C3	B2	ND																
C3	B3	ND																
C3	B4	ND																
C3	B5	ND																
C3	B6	ND																
C3	B7	ND																
C3	B8	ND																
C3	B9	ND																
C3	B10	ND																
C3	C1	ND																
C3	C2	ND																
C3	C3	ND																
C3	C4	ND																
C3	C5	ND																
C3	C6	ND																
C3	C7	ND																
C3	C8	ND																
C3	C9	ND																
C3	C10	ND																
C3	D1	ND																
C3	D2	ND																
C3	D3	ND																
C3	D4	ND																
C3	D5	ND																
C3	D6	ND																
C3	D7	ND																
C3	D8	ND																
C3	D9	ND																
C3	D10	ND																
C3	E1	ND																
C3	E2	ND																
C3	E3	ND																
C3	E4	ND																
C3	E5	ND																
C3	E6	ND																
C3	E7	ND																
C3	E8	ND																
C3	E9	ND																
C3	E10	ND																
C3	F1	ND																
C3	F2	ND																
C3	F3	ND																
C3	F4	ND																
C3	F5	ND																
C3	F6	ND																
C3	F7	ND																
C3	F8	ND																
C3	F9	ND																
C3	F10	ND																
C3	G1	ND																
C3	G2	ND																
C3	G3	ND																
C3	G4	ND																
C3	G5	ND																
C3	G6	ND																

LIBBY

TEM Asbestos Structure Count

0412-003_BA-00002_271300244-0002_TEM-ISO_AR_06-19-13_IA_NotQC_C0.xlsm

EPA SAMPLE ID:	BA-00002
LAB SAMPLE ID:	271300244-0002

Matrix	Air
Analysis Method	TEM-ISO

Prep	Indirect - Ashed
QC Type	NotQC

ERROR CHECK

OK - No errors found

Data Entry by (e.g., M. Smith)

B. Gallagher

QA by (e.g., M. Smith) M. Smollock

Data Entry date	6/21/2013
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QA date	7/1/2013
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Target Sensitivity Reached-Complete current GO, then stop.

[illegible]

LIBBY
TEM Asbestos Structure Count

0412-003_BA-00002_271300244-0002_TEM-ISO_AR_06-19-13_IA_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00002
 LAB SAMPLE ID: 271300244-0002

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Indirect - Ashed
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/21/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
C5	G10	ND																
C5	H1	ND																
C5	H2	ND																
C5	H3	ND																
C5	H4	ND																
C5	H5	ND																
C5	H6	ND																
C5	H7	ND																
C5	H8	ND																
C5	H9	ND																
C5	H10	ND																
C5	I1	ND																
C5	I2	ND																
C5	I3	ND																
C5	I4	ND																
C5	I5	ND																
C5	I6	ND																
C5	I7	ND																
C5	I8	ND																
C5	I9	ND																
C5	I10	ND																
C5	J1	ND																
C5	J2	ND																
C5	J3	ND																
C5	J4	ND																
C5	J5	ND																
C5	J6	ND																
C5	J7	ND																
C5	J8	ND																
C5	J9	ND																
C5	J10	ND																
C7	A1	ND																
C7	A2	ND																
C7	A3	ND																
C7	A4	ND																
C7	A5	ND																
C7	A6	ND																
C7	A7	ND																
C7	A8	ND																
C7	A9	ND																
C7	A10	ND																
C7	B1	ND																
C7	B2	ND																
C7	B3	ND																
C7	B4	ND																
C7	B5	ND																
C7	B6	ND																
C7	B7	ND																
C7	B8	ND																
C7	B9	ND																
C7	B10	ND																
C7	C1	ND																
C7	C2	ND																
C7	C3	ND																
C7	C4	ND																
C7	C5	ND																
C7	C6	ND																
C7	C7	ND																
C7	C8	ND																
C7	C9	ND																
C7	C10	ND																
C7	D1	ND																
C7	D2	ND																
C7	D3	ND																
C7	D4	ND																
C7	D5	ND																
C7	D6	ND																
C7	D7	ND																
C7	D8	ND																
C7	D9	ND																
C7	D10	ND																
C7	E1	ND																
C7	E2	ND																
C7	E3	ND																
C7	E4	ND																
C7	E5	ND																
C7	E6	ND																
C7	E7	ND																
C7	E8	ND																
C7	E9	ND																
C7	E10	ND																
C7	F1	ND																
C7	F2	ND																

LIBBY
TEM Asbestos Structure Count

0412-003_BA-00002_271300244-0002_TEM-ISO_AR_06-19-13_IA_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00002
 LAB SAMPLE ID: 271300244-0002

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Indirect - Ashed
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/21/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
C7	F3	ND																
C7	F4	ND																
C7	F5	ND																
C7	F6	ND																
C7	F7	ND																
C7	F8	ND																
C7	F9	ND																
C7	F10	ND																
C7	G1	ND																
C7	G2	ND																
C7	G3	ND																
C7	G4	ND																
C7	G5	ND																
C7	G6	ND																
C7	G7	ND																
C7	G8	ND																
C7	G9	ND																
C7	G10	ND																
C7	H1	ND																
C7	H2	ND																
C7	H3	ND																
C7	H4	ND																
C7	H5	ND																
C7	H6	ND																
C7	H7	ND																
C7	H8	ND																
C7	H9	ND																
C7	H10	ND																
C7	I1	ND																
C7	I2	ND																
C7	I3	ND																
C7	I4	ND																
C7	I5	ND																
C7	I6	ND																
C7	I7	ND																
C7	I8	ND																
C7	I9	ND																
C7	I10	ND																
C7	J1	ND																
C7	J2	ND																
C7	J3	ND																
C7	J4	ND																
C7	J5	ND																
C7	J6	ND																
C7	J7	ND																
C7	J8	ND																
C7	J9	ND																
C7	J10	ND																
C9	A1	ND																
C9	A2	ND																
C9	A3	ND																
C9	A4	ND																
C9	A5	ND																
C9	A6	ND																
C9	A7	ND																
C9	A8	ND																
C9	A9	ND																
C9	A10	ND																
C9	B1	ND																
C9	B2	ND																
C9	B3	ND																
C9	B4	ND																
C9	B5	ND																
C9	B6	ND																
C9	B7	ND																
C9	B8	ND																
C9	B9	ND																
C9	B10	ND																
C9	C1	ND																
C9	C2	ND																
C9	C3	ND																
C9	C4	ND																
C9	C5	ND																
C9	C6	ND																
C9	C7	ND																
C9	C8	ND																
C9	C9	ND																
C9	C10	ND																
C9	D1	ND																
C9	D2	ND																
C9	D3	ND																
C9	D4	ND																
C9	D5	ND																

LIBBY
TEM Asbestos Structure Count

0412-003_BA-00002_271300244-0002_TEM-ISO_AR_06-19-13_IA_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00002
 LAB SAMPLE ID: 271300244-0002

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Indirect - Ashed
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/21/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
C9	D6	ND																
C9	D7	ND																
C9	D8	ND																
C9	D9	ND																
C9	D10	ND																

LIBBY

TEM Asbestos Structure Count -- ISO 10312

EPA Sample Number BA-00011
Tag AL1
Status ANALYZED
Lab QC Type NOT QC
Lab Sample Number 271300244-0003
Matrix Air
Category Field
Prep Direct
Analysis Method TEM-ISO
Est. Particulate Loading 6%

PARAMETERS

Effective filter area 385.0 mm2
F factor 1.00E+00
Number of Grid Openings (amphibole) 105
Number of Grid Openings (chrysotile) 105
Grid opening area 0.013 mm2
Volume (L) or Area (cm2) 706 L
Sensitivity (amphibole) 4.00E-04 s/cc
Sensitivity (chrysotile) 4.00E-04 s/cc
Area Examined (amphibole) 1.365 mm2
Area Examined (chrysotile) 1.365 mm2

Magnification: LOW

Recording Rules:

Min AR	Min length (um)	Min width (um)
3:1	5	0.25

Stopping Rules:

Target Sens.	Max AE (mm ²)	Max N LA
0.0004	10.000	25

COUNTS (based on countable structures only)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0	0	0	0

CONCENTRATION (s/cc)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total: Length > 0.5 um, Aspect Ratio >= 3:1

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

Chi-sq test for filter loading --

p value: 1.0E+00

interpretation: OK

LIBBY

TEM Asbestos Structure Count

Laboratory ID:	EML27		EPA Sample Number:	BA-00011	Tag	AL1	
Instrument ID	OL 100 CX II (27-2)		Matrix	Air			
Voltage (KV)	100		Air volume (L), dust sample area (cm ²), or dustfall container area (cm ²):	706			
Magnification (do not include X)	4,800	LOW	Date received by lab	5/21/2013			
Grid opening area (mm ²)	0.0130		Lab Job Number:	271300244			
Scale: 1L =	1.000		Lab Sample Number:	271300244-0003			
Scale: 1D =	1.000		Number of grids prepared	10			
Primary filter area (mm ²)	385.0		Prepared by (e.g., M. Smith)	D. Barney			
Secondary Filter Area (mm ²)	360.0		Preparation date	4/15/2009			
Category	Field		EPA COC Number	0412-003			
Filter Status	ANALYZED		Estimated Particulate Loading (%)	6%			

COMMENTS

Also analyzed on 7/1/2013.

Analyzed by (e.g., M. Smith)	E. Wyatt-Pescador	
Analysis date	6/20/2013	
Prep	Direct	
If sample type = air, is there loose material or debris in the bowl?	No	
Analysis Method	TEM-ISO	
Analysis Method SOP	ISO 10312	
Grid storage location	2713-LIB-56	
Archive filter(s) storage location	ESAT Archive	
F- factor	1	
Lab QC Type	NOT QC	

Recording Rules:

3:1	Minimum Aspect Ratio
5.00	Minimum Length (um)
0.25	Minimum Width (um)

Stopping Rules:

0.00040	Target Sensitivity
105	GOs required to reach target
10.000	Maximum Area Examined (mm ²)
770	GOs required to reach max area
25	Maximum # of Structures
105	Estimated # of GOs required

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing
(For dust and dustfall, enter 1.0)

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

V

Supplemental Air Analysis

☐ Check box if supplemental analysisAchieved sensitivity (cc⁻¹) from the original analysis

Note: When the box is checked above, the est. # of GOs required that is calculated will automatically take into account the GOs examined during the original analysis.

LIBBY
TEM Asbestos Structure Count

0412-003_BA-00011_271300244-0003_TEM-ISO_AR_06-20-13_D_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00011
 LAB SAMPLE ID: 271300244-0003

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Direct
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/21/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/2/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
E1	A1	ND																
E1	A2	ND																
E1	A3	ND																
E1	A4	ND																
E1	A5	ND																
E1	A6	ND																
E1	A7	ND																
E1	A8	ND																
E1	A9	ND																
E1	A10	ND																
E1	B1	ND																
E1	B2	ND																
E1	B3	ND																
E1	B4	ND																
E1	B5	ND																
E1	B6	ND																
E1	B7	ND																
E1	B8	ND																
E1	B9	ND																
E1	B10	ND																
E1	C1	ND																
E1	C2	ND																
E1	C3	ND																
E1	C4	ND																
E1	C5	ND																
E1	C6	ND																
E1	C7	ND																
E1	C8	ND																
E1	C9	ND																
E1	C10	ND																
E1	D1	ND																
E1	D2	ND																
E1	D3	ND																
E1	D4	ND																
E1	D5	ND																
E1	D6	ND																
E1	D7	ND																
E1	D8	ND																
E1	D9	ND																
E1	D10	ND																
E1	E1	ND																
E1	E2	ND																
E1	E3	ND																
E1	E4	ND																
E1	E5	ND																
E3	A1	ND																
E3	A2	ND																
E3	A3	ND																
E3	A4	ND																
E3	A5	ND																
E3	A6	ND																
E3	A7	ND																
E3	A8	ND																
E3	A9	ND																
E3	A10	ND																
E3	B1	ND																
E3	B2	ND																
E3	B3	ND																
E3	B4	ND																
E3	B5	ND																
E3	B6	ND																
E3	B7	ND																
E3	B8	ND																
E3	B9	ND																
E3	B10	ND																
E3	C1	ND																
E3	C2	ND																
E3	C3	ND																
E3	C4	ND																
E3	C5	ND																
E3	C6	ND																
E3	C7	ND																
E3	C8	ND																
E3	C9	ND																
E3	C10	ND																
E3	D1	ND																
E3	D2	ND																
E3	D3	ND																
E3	D4	ND																
E3	D5	ND																
E3	D6	ND																
E3	D7	ND																
E3	D8	ND																

LIBBY
TEM Asbestos Structure Count

0412-003_BA-00011_271300244-0003_TEM-ISO_AR_06-20-13_D_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00011
 LAB SAMPLE ID: 271300244-0003

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Direct
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/21/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/2/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
E3	D9	ND																
E3	D10	ND																
E3	E1	ND																
E3	E2	ND																
E3	E3	ND																
E3	E4	ND																
E3	E5	ND																
E3	E6	ND																
E3	E7	ND																
E3	E8	ND																
E3	E9	ND																
E3	E10	ND																
E3	F1	ND																
E3	F2	ND																
E3	F3	ND																
E3	F4	ND																
E3	F5	ND																
E5	H1	ND																
E5	H3	ND																
E5	H5	ND																
E5	H7	ND																
E5	H9	ND																

LIBBY

TEM Asbestos Structure Count -- ISO 10312

EPA Sample Number BA-00012
Tag AL1
Status ANALYZED
Lab QC Type NOT QC
Lab Sample Number 271300244-0004
Matrix Air
Category Field
Prep Direct
Analysis Method TEM-ISO
Est. Particulate Loading 7%

PARAMETERS

Effective filter area 385.0 mm2
F factor 1.00E+00
Number of Grid Openings (amphibole) 110
Number of Grid Openings (chrysotile) 110
Grid opening area 0.013 mm2
Volume (L) or Area (cm2) 687 L
Sensitivity (amphibole) 3.92E-04 s/cc
Sensitivity (chrysotile) 3.92E-04 s/cc
Area Examined (amphibole) 1.430 mm2
Area Examined (chrysotile) 1.430 mm2

Magnification: LOW

Recording Rules:

Min AR	Min length (um)	Min width (um)
3:1	5	0.25

Stopping Rules:

Target Sens.	Max AE (mm ²)	Max N LA
0.0004	10.000	25

COUNTS (based on countable structures only)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0	0	0	0

CONCENTRATION (s/cc)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total: Length > 0.5 um, Aspect Ratio >= 3:1

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

Chi-sq test for filter loading --

p value: 1.0E+00

interpretation: OK

LIBBY

TEM Asbestos Structure Count

Laboratory ID:	EMSL27		EPA Sample Number:	BA-00012	Tag	AL1	
Instrument ID	OL 100 CX II (27-2)		Matrix	Air			
Voltage (KV)	100		Air volume (L), dust sample area (cm ²), or dustfall container area (cm ²):	687			
Magnification (do not include X)	4,800	LOW	Date received by lab	5/21/2013			
Grid opening area (mm ²)	0.0130		Lab Job Number:	271300244			
Scale: 1L =	1.000		Lab Sample Number:	271300244-0004			
Scale: 1D =	1.000		Number of grids prepared	10			
Primary filter area (mm ²)	385.0		Prepared by (e.g., M. Smith)	D. Barney			
Secondary Filter Area (mm ²)	360.0		Preparation date	4/15/2009			
Category	Field		EPA COC Number	0412-003			
Filter Status	ANALYZED		Estimated Particulate Loading (%)	7%			

Analyzed by (e.g., M. Smith)	E. Wyatt-Pescador	
Analysis date	6/20/2013	
Prep	Direct	
If sample type = air, is there loose material or debris in the bowl?	No	
Analysis Method	TEM-ISO	
Analysis Method SOP	ISO 10312	
Grid storage location	2713-LIB-56	
Archive filter(s) storage location	ESAT Archive	
F- factor	1	
Lab QC Type	NOT QC	

Recording Rules:

3:1	Minimum Aspect Ratio
5.00	Minimum Length (um)
0.25	Minimum Width (um)

Stopping Rules:

0.00040	Target Sensitivity
108	GOs required to reach target
10.000	Maximum Area Examined (mm ²)
770	GOs required to reach max area
25	Maximum # of Structures
108	Estimated # of GOs required

F-factor Calculation:

Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

F-factor

Grid opening traverse direction:	V
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Supplemental Air Analysis

☐ Check box if supplemental analysisAchieved sensitivity (cc⁻¹) from the original analysis

Note: When the box is checked above, the est. # of GOs required that is calculated will automatically take into account the GOs examined during the original analysis.

COMMENTS

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LIBBY
TEM Asbestos Structure Count

0412-003_BA-00012_271300244-0004_TEM-ISO_AR_06-20-13_D_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00012
 LAB SAMPLE ID: 271300244-0004

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Direct
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): A. Fearfield
 Data Entry date: 6/21/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
G1	A1	ND																
G1	A2	ND																
G1	A3	ND																
G1	A4	ND																
G1	A5	ND																
G1	A6	ND																
G1	A7	ND																
G1	A8	ND																
G1	A9	ND																
G1	A10	ND																
G1	B1	ND																
G1	B2	ND																
G1	B3	ND																
G1	B4	ND																
G1	B5	ND																
G1	B6	ND																
G1	B7	ND																
G1	B8	ND																
G1	B9	ND																
G1	B10	ND																
G1	C1	ND																
G1	C2	ND																
G1	C3	ND																
G1	C4	ND																
G1	C5	ND																
G1	C6	ND																
G1	C7	ND																
G1	C8	ND																
G1	C9	ND																
G1	C10	ND																
G1	D1	ND																
G1	D2	ND																
G1	D3	ND																
G1	D4	ND																
G1	D5	ND																
G1	D6	ND																
G1	D7	ND																
G1	D8	ND																
G1	D9	ND																
G1	D10	ND																
G1	E1	ND																
G1	E2	ND																
G1	E3	ND																
G1	E4	ND																
G1	E5	ND																
G1	E6	ND																
G1	E7	ND																
G1	E8	ND																
G1	E9	ND																
G1	E10	ND																
G3	A1	ND																
G3	A2	ND																
G3	A3	ND																
G3	A4	ND																
G3	A5	ND																
G3	A6	ND																
G3	A7	ND																
G3	A8	ND																
G3	A9	ND																
G3	A10	ND																
G3	B1	ND																
G3	B2	ND																
G3	B3	ND																
G3	B4	ND																
G3	B5	ND																
G3	B6	ND																
G3	B7	ND																
G3	B8	ND																
G3	B9	ND																
G3	B10	ND																
G3	C1	ND																
G3	C2	ND																
G3	C3	ND																
G3	C4	ND																
G3	C5	ND																
G3	C6	ND																
G3	C7	ND																
G3	C8	ND																
G3	C9	ND																
G3	C10	ND																
G3	D1	ND																
G3	D2	ND																
G3	D3	ND																

LIBBY
TEM Asbestos Structure Count

0412-003_BA-00012_271300244-0004_TEM-ISO_AR_06-20-13_D_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00012
 LAB SAMPLE ID: 271300244-0004

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Direct
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): A. Fearfield
 Data Entry date: 6/21/2013

QA by (e.g., M. Smith): M. Smollock
 QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	QA	CH	NAM				Sketch	Photo	EDS	
G3	D4	ND																
G3	D5	ND																
G3	D6	ND																
G3	D7	ND																
G3	D8	ND																
G3	D9	ND																
G3	D10	ND																
G3	E1	ND																
G3	E2	ND																
G3	E3	ND																
G3	E4	ND																
G3	E5	ND																
G3	E6	ND																
G3	E7	ND																
G3	E8	ND																
G3	E9	ND																
G3	E10	ND																
G3	F1	ND																
G3	F2	ND																
G3	F3	ND																
G3	F4	ND																
G3	F5	ND																
G3	F6	ND																
G3	F7	ND																
G3	F8	ND																
G3	F9	ND																
G3	F10	ND																

LIBBY

TEM Asbestos Structure Count -- ISO 10312

EPA Sample Number BA-00021
Tag AL1
Status ANALYZED
Lab QC Type NOT QC
Lab Sample Number 271300244-0005
Matrix Air
Category Field
Prep Direct
Analysis Method TEM-ISO
Est. Particulate Loading 5%

PARAMETERS

Effective filter area 385.0 mm2
 F factor 1.00E+00
 Number of Grid Openings (amphibole) 75
 Number of Grid Openings (chrysotile) 75
 Grid opening area 0.013 mm2
 Volume (L) or Area (cm2) 988 L
 Sensitivity (amphibole) 4.00E-04 s/cc
 Sensitivity (chrysotile) 4.00E-04 s/cc
 Area Examined (amphibole) 0.975 mm2
 Area Examined (chrysotile) 0.975 mm2

Magnification: LOW

Recording Rules:

Min AR	Min length (um)	Min width (um)
3:1	5	0.25

Stopping Rules:

Target Sens.	Max AE (mm ²)	Max N LA
0.0004	10.000	25

COUNTS (based on countable structures only)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0	0	0	0

CONCENTRATION (s/cc)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total: Length > 0.5 um, Aspect Ratio >= 3:1

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

Chi-sq test for filter loading --

p value: 1.0E+00

interpretation: OK

FILE NAME: 0412-003_BA-00021_271300244-0005_TEM-ISO_AR_06-20-13_D_NotQC_C0.xlsm

FILE TYPE: Original

LIBBY

TEM Asbestos Structure Count

Laboratory ID:	EMSL27		EPA Sample Number:	BA-00021	Tag	AL1	
Instrument ID	OL 100 CX II (27-2)		Matrix	Air			
Voltage (KV)	100		Air volume (L), dust sample area (cm ²), or dustfall container area (cm ²):	988			
Magnification (do not include X)	4,800	LOW	Date received by lab	5/21/2013			
Grid opening area (mm ²)	0.0130		Lab Job Number:	271300244			
Scale: 1L =	1.000		Lab Sample Number:	271300244-0005			
Scale: 1D =	1.000		Number of grids prepared	10			
Primary filter area (mm ²)	385.0		Prepared by (e.g., M. Smith)	D. Bamey			
Secondary Filter Area (mm ²)	360.0		Preparation date	4/15/2009			
Category	Field		EPA COC Number	0412-003			
Filter Status	ANALYZED		Estimated Particulate Loading (%)	5%			

Analyzed by (e.g., M. Smith)	E. Wyatt-Pescador	
Analysis date	6/20/2013	
Prep	Direct	
If sample type = air, is there loose material or debris in the bowl?	No	
Analysis Method	TEM-ISO	
Analysis Method SOP	ISO 10312	
Grid storage location	2713-LIB-56	
Archive filter(s) storage location	ESAT Archive	
F- factor	1	
Lab QC Type	NOT QC	

Recording Rules:

3:1	Minimum Aspect Ratio
5.00	Minimum Length (um)
0.25	Minimum Width (um)

Stopping Rules:

0.00040	Target Sensitivity
75	GOs required to reach target
10.000	Maximum Area Examined (mm ²)
770	GOs required to reach max area
25	Maximum # of Structures
75	Estimated # of GOs required

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

V

Supplemental Air Analysis

☐ Check box if supplemental analysisAchieved sensitivity (cc⁻¹) from the original analysis

Note: When the box is checked above, the est. # of GOs required that is calculated will automatically take into account the GOs examined during the original analysis.

COMMENTS

LIBBY
TEM Asbestos Structure Count

0412-003_BA-00021_271300244-0005_TEM-ISO_AR_06-20-13_D_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00021
 LAB SAMPLE ID: 271300244-0005

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Direct
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): A. Fearfield
 Data Entry date: 6/21/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
I1	A1	ND																
I1	A2	ND																
I1	A3	ND																
I1	A4	ND																
I1	A5	ND																
I1	A6	ND																
I1	A7	ND																
I1	A8	ND																
I1	A9	ND																
I1	A10	ND																
I1	C1	ND																
I1	C2	ND																
I1	C3	ND																
I1	C4	ND																
I1	C5	ND																
I1	C6	ND																
I1	C7	ND																
I1	C8	ND																
I1	C9	ND																
I1	C10	ND																
I1	D1	ND																
I1	D2	ND																
I1	D3	ND																
I1	D4	ND																
I1	D5	ND																
I1	D6	ND																
I1	D7	ND																
I1	D8	ND																
I1	D9	ND																
I1	D10	ND																
I1	F1	ND																
I1	F2	ND																
I1	F3	ND																
I1	F4	ND																
I1	F5	ND																
I1	F6	ND																
I1	F7	ND																
I1	F8	ND																
I1	F9	ND																
I1	F10	ND																
I3	B1	ND																
I3	B2	ND																
I3	B3	ND																
I3	B4	ND																
I3	B5	ND																
I3	B6	ND																
I3	B7	ND																
I3	B8	ND																
I3	B9	ND																
I3	B10	ND																
I3	D1	ND																
I3	D2	ND																
I3	D3	ND																
I3	D4	ND																
I3	D5	ND																
I3	D6	ND																
I3	D7	ND																
I3	D8	ND																
I3	D9	ND																
I3	D10	ND																
I3	F1	ND																
I3	F2	ND																
I3	F3	ND																
I3	F4	ND																
I3	F5	ND																
I3	F6	ND																
I3	F7	ND																
I3	F8	ND																
I3	F9	ND																
I3	F10	ND																
I3	I1	ND																
I3	I2	ND																
I3	I3	ND																
I3	I4	ND																
I3	I5	ND																

LIBBY

TEM Asbestos Structure Count -- ISO 10312

EPA Sample Number BA-00022
Tag AL1
Status ANALYZED
Lab QC Type NOT QC
Lab Sample Number 271300244-0006
Matrix Air
Category Field
Prep Direct
Analysis Method TEM-ISO
Est. Particulate Loading 5%

PARAMETERS

Effective filter area 385.0 mm2
F factor 1.00E+00
Number of Grid Openings (amphibole) 73
Number of Grid Openings (chrysotile) 73
Grid opening area 0.013 mm2
Volume (L) or Area (cm2) 1016 L
Sensitivity (amphibole) 3.99E-04 s/cc
Sensitivity (chrysotile) 3.99E-04 s/cc
Area Examined (amphibole) 0.949 mm2
Area Examined (chrysotile) 0.949 mm2

Magnification: LOW

Recording Rules:

Min AR	Min length (um)	Min width (um)
3:1	5	0.25

Stopping Rules:

Target Sens.	Max AE (mm ²)	Max N LA
0.0004	10.000	25

COUNTS (based on countable structures only)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0	0	0	0

CONCENTRATION (s/cc)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total: Length > 0.5 um, Aspect Ratio >= 3:1

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

Chi-sq test for filter loading --

p value: 1.0E+00

interpretation: OK

LIBBY

TEM Asbestos Structure Count

Laboratory ID:	EMSL27	EPA Sample Number:	BA-00022	Tag	AL1	Analyzed by (e.g., M. Smith)	E. Wyatt-Pescador
Instrument ID	OL 100 CX II (27-2)	Matrix	Air			Analysis date	6/21/2013
Voltage (KV)	100	Air volume (L), dust sample area (cm ²), or dustfall container area (cm ²):	1016			Prep	Direct
Magnification (do not include X)	4,800	Date received by lab	5/21/2013			If sample type = air, is there loose material or debris in the bowl?	No
Grid opening area (mm ²)	0.0130	Lab Job Number:	271300244			Analysis Method	TEM-ISO
Scale: 1L =	1.000	Lab Sample Number:	271300244-0006			Analysis Method SOP	ISO 10312
Scale: 1D =	1.000	Number of grids prepared	10			Grid storage location	2713-LIB-56
Primary filter area (mm ²)	385.0	Prepared by (e.g., M. Smith)	D. Barney			Archive filter(s) storage location	ESAT Archive
Secondary Filter Area (mm ²)	360.0	Preparation date	4/15/2009				
Category	Field	EPA COC Number	0412-003			F- factor	1
Filter Status	ANALYZED	Estimated Particulate Loading (%)	5%			Lab QC Type	NOT QC

COMMENTS

Also analyzed on 7/1/2013.

Recording Rules:

3:1	Minimum Aspect Ratio
5.00	Minimum Length (um)
0.25	Minimum Width (um)

Stopping Rules:

0.00040	Target Sensitivity
73	GOs required to reach target
10.000	Maximum Area Examined (mm ²)
770	GOs required to reach max area
25	Maximum # of Structures
73	Estimated # of GOs required

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

V

Supplemental Air Analysis

☐ Check box if supplemental analysisAchieved sensitivity (cc⁻¹) from the original analysis

Note: When the box is checked above, the est. # of GOs required that is calculated will automatically take into account the GOs examined during the original analysis.

LIBBY
TEM Asbestos Structure Count

0412-003_BA-00022_271300244-0006_TEM-ISO_AR_06-21-13_D_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00022
LAB SAMPLE ID: 271300244-0006

Matrix: Air
Analysis Method: TEM-ISO

Prep: Direct
QC Type: NotQC

ERROR CHECK
OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
Data Entry date: 6/25/2013
QA by (e.g., M. Smith): M. Smollock
QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
K2	B2	ND																
K2	B4	ND																
K2	B6	ND																
K2	B8	ND																
K2	B10	ND																
K2	C1	ND																
K2	C3	ND																
K2	C5	ND																
K2	C7	ND																
K2	C9	ND																
K2	D2	ND																
K2	D4	ND																
K2	D6	ND																
K2	D8	ND																
K2	D10	ND																
K2	E1	ND																
K2	E3	ND																
K2	E5	ND																
K2	E7	ND																
K2	E9	ND																
K2	F2	ND																
K2	F4	ND																
K2	F6	ND																
K2	F8	ND																
K2	F10	ND																
K2	G1	ND																
K2	G3	ND																
K2	G5	ND																
K2	G7	ND																
K2	G9	ND																
K2	H2	ND																
K2	H4	ND																
K2	H6	ND																
K2	H8	ND																
K2	H10	ND																
K4	A1	ND																
K4	A3	ND																
K4	A5	ND																
K4	A7	ND																
K4	A9	ND																
K4	B2	ND																
K4	B4	ND																
K4	B6	ND																
K4	B8	ND																
K4	B10	ND																
K4	C1	ND																
K4	C3	ND																
K4	C5	ND																
K4	C7	ND																
K4	C9	ND																
K4	E2	ND																
K4	E4	ND																
K4	E6	ND																
K4	E8	ND																
K4	E10	ND																
K4	F1	ND																
K4	F3	ND																
K4	F5	ND																
K4	F7	ND																
K4	F9	ND																
K4	G2	ND																
K4	G4	ND																
K4	G6	ND																
K4	G8	ND																
K4	G10	ND																
K4	H1	ND																
K4	H3	ND																
K4	H5	ND																
K4	H7	ND																
K4	H9	ND																
K6	B4	ND																
K6	B6	ND																
K6	B8	ND																

LIBBY

TEM Asbestos Structure Count -- ISO 10312

EPA Sample Number BA-00029
Tag AL1
Status ANALYZED
Lab QC Type NOT QC
Lab Sample Number 271300244-0007
Matrix Air
Category Field
Prep Direct
Analysis Method TEM-ISO
Est. Particulate Loading 6%

PARAMETERS

Effective filter area 385.0 mm2
F factor 1.00E+00
Number of Grid Openings (amphibole) 65
Number of Grid Openings (chrysotile) 65
Grid opening area 0.013 mm2
Volume (L) or Area (cm2) 1145 L
Sensitivity (amphibole) 3.98E-04 s/cc
Sensitivity (chrysotile) 3.98E-04 s/cc
Area Examined (amphibole) 0.845 mm2
Area Examined (chrysotile) 0.845 mm2

Magnification: LOW

Recording Rules:

Min AR	Min length (um)	Min width (um)
3:1	5	0.25

Stopping Rules:

Target Sens.	Max AE (mm ²)	Max N LA
0.0004	10.000	25

COUNTS (based on countable structures only)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0	0	0	0

CONCENTRATION (s/cc)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total: Length > 0.5 um, Aspect Ratio >= 3:1

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

Chi-sq test for filter loading --

p value: 1.0E+00

interpretation: OK

LIBBY

TEM Asbestos Structure Count

Laboratory ID:	EMSL27		EPA Sample Number:	BA-00029	Tag	AL1	
Instrument ID	OL 100 CX II (27-2)		Matrix	Air			
Voltage (KV)	100		Air volume (L), dust sample area (cm ²), or dustfall container area (cm ²):	1145			
Magnification (do not include X)	4,800	LOW	Date received by lab	5/21/2013			
Grid opening area (mm ²)	0.0130		Lab Job Number:	271300244			
Scale: 1L =	1.000		Lab Sample Number:	271300244-0007			
Scale: 1D =	1.000		Number of grids prepared	10			
Primary filter area (mm ²)	385.0		Prepared by (e.g., M. Smith)	D. Barney			
Secondary Filter Area (mm ²)	360.0		Preparation date	4/15/2009			
Category	Field		EPA COC Number	0412-003			
Filter Status	ANALYZED		Estimated Particulate Loading (%)	6%			

Analyzed by (e.g., M. Smith)	E. Wyatt-Pescador
Analysis date	6/21/2013
Prep	Direct
If sample type = air, is there loose material or debris in the cow?	No
Analysis Method	TEM-ISO
Analysis Method SOP	ISO 10312
Grid storage location	2713-LIB-56
Archive filter(s) storage location	ESAT Archive
F- factor	1
Lab QC Type	NOT QC

Recording Rules:

3:1	Minimum Aspect Ratio
5.00	Minimum Length (um)
0.25	Minimum Width (um)

Stopping Rules:

0.00040	Target Sensitivity
65	GOs required to reach target
10.000	Maximum Area Examined (mm ²)
770	GOs required to reach max area
25	Maximum # of Structures
65	Estimated # of GOs required

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
First resuspension volume or rinsate volume (mL)
Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)
Volume applied to secondary filter (mL) or used for serial dilution
Third resuspension volume (mL)
Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing
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F-factor

Grid opening traverse direction:	V
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Supplemental Air Analysis

☐ Check box if supplemental analysisAchieved sensitivity (cc⁻¹) from the original analysis

Note: When the box is checked above, the est. # of GOs required that is calculated will automatically take into account the GOs examined during the original analysis.

COMMENTS

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LIBBY
TEM Asbestos Structure Count

0412-003_BA-00029_271300244-0007_TEM-ISO_AR_06-21-13_D_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00029
 LAB SAMPLE ID: 271300244-0007

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Direct
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/25/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
M2	A1	ND																
M2	A3	ND																
M2	A5	ND																
M2	A7	ND																
M2	A9	ND																
M2	B2	ND																
M2	B4	ND																
M2	B6	ND																
M2	B8	ND																
M2	B10	ND																
M2	C1	ND																
M2	C3	ND																
M2	C5	ND																
M2	C7	ND																
M2	C9	ND																
M2	D2	ND																
M2	D4	ND																
M2	D6	ND																
M2	D8	ND																
M2	D10	ND																
M2	E1	ND																
M2	E3	ND																
M2	E5	ND																
M2	E7	ND																
M2	E9	ND																
M2	F2	ND																
M2	F4	ND																
M2	F6	ND																
M2	F8	ND																
M2	F10	ND																
M4	B2	ND																
M4	B4	ND																
M4	B6	ND																
M4	B8	ND																
M4	B10	ND																
M4	C1	ND																
M4	C3	ND																
M4	C5	ND																
M4	C7	ND																
M4	C9	ND																
M4	F2	ND																
M4	F4	ND																
M4	F6	ND																
M4	F8	ND																
M4	F10	ND																
M4	G1	ND																
M4	G3	ND																
M4	G5	ND																
M4	G7	ND																
M4	G9	ND																
M4	H2	ND																
M4	H4	ND																
M4	H6	ND																
M4	H8	ND																
M4	H10	ND																
M4	I1	ND																
M4	I3	ND																
M4	I5	ND																
M4	I7	ND																
M4	I9	ND																
M4	J2	ND																
M4	J4	ND																
M4	J6	ND																
M4	J8	ND																
M4	J10	ND																

LIBBY

TEM Asbestos Structure Count -- ISO 10312

EPA Sample Number BA-00030
Tag AL1
Status ANALYZED
Lab QC Type NOT QC
Lab Sample Number 271300244-0008
Matrix Air
Category Field
Prep Direct
Analysis Method TEM-ISO
Est. Particulate Loading 3%

PARAMETERS

Effective filter area 385.0 mm2
F factor 1.00E+00
Number of Grid Openings (amphibole) 65
Number of Grid Openings (chrysotile) 65
Grid opening area 0.013 mm2
Volume (L) or Area (cm2) 1145 L
Sensitivity (amphibole) 3.98E-04 s/cc
Sensitivity (chrysotile) 3.98E-04 s/cc
Area Examined (amphibole) 0.845 mm2
Area Examined (chrysotile) 0.845 mm2

Magnification: LOW

Recording Rules:

Min AR	Min length (um)	Min width (um)
3:1	5	0.25

Stopping Rules:

Target Sens.	Max AE (mm ²)	Max N LA
0.0004	10.000	25

COUNTS (based on countable structures only)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0	0	0	0

CONCENTRATION (s/cc)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total: Length > 0.5 um, Aspect Ratio >= 3:1

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

Chi-sq test for filter loading --

p value: 1.0E+00

interpretation: OK

LIBBY

TEM Asbestos Structure Count

Laboratory ID:	EMSL27	▼
Instrument ID	OL 100 CX II (27-2)	
Voltage (KV)	100	
Magnification (do not include X)	4,800	LOW
Grid opening area (mm ²)	0.0130	
Scale: 1L =	1.000	
Scale: 1D =	1.000	
Primary filter area (mm ²)	385.0	
Secondary Filter Area (mm ²)	360.0	
Category	Field	▼
Filter Status	ANALYZED	▼

EPA Sample Number:	BA-00030	Tag	AL1	▼
Matrix			Air	▼
Air volume (L), dust sample area (cm ²), or dustfall container area (cm ²):			1145	
Date received by lab			5/21/2013	
Lab Job Number:			271300244	
Lab Sample Number:			271300244-0008	
Number of grids prepared			10	
Prepared by (e.g., M. Smith)			D. Barney	
Preparation date			4/15/2009	
EPA COC Number			0412-003	
Estimated Particulate Loading (%)			3%	

Analyzed by (e.g., M. Smith)	E. Wyatt-Pescador	
Analysis date	6/21/2013	
Prep	Direct	▼
If sample type = air, is there loose material or debris in the cowl?	No	▼
Analysis Method	TEM-ISO	▼
Analysis Method SOP	ISO 10312	
Grid storage location	2713-LIB-56	
Archive filter(s) storage location	ESAT Archive	
F- factor	1	
Lab QC Type	NOT QC	▼

Recording Rules:

3:1	▼	Minimum Aspect Ratio
5.00		Minimum Length (um)
0.25		Minimum Width (um)

Stopping Rules:

0.00040	Target Sensitivity
65	GOs required to reach target
10.000	Maximum Area Examined (mm ²)
770	GOs required to reach max area
25	Maximum # of Structures
65	Estimated # of GOs required

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:	V
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Supplemental Air Analysis

☐ Check box if supplemental analysis

Achieved sensitivity (cc⁻¹) from the original analysis

Note: When the box is checked above, the est. # of GOs required that is calculated will automatically take into account the GOs examined during the original analysis.

COMMENTS

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LIBBY
TEM Asbestos Structure Count

0412-003_BA-00030_271300244-0008_TEM-ISO_AR_06-21-13_D_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00030
 LAB SAMPLE ID: 271300244-0008

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Direct
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/25/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
O2	A2	ND																
O2	A4	ND																
O2	A6	ND																
O2	A8	ND																
O2	A10	ND																
O2	B1	ND																
O2	B3	ND																
O2	B5	ND																
O2	B7	ND																
O2	B9	ND																
O2	D2	ND																
O2	D4	ND																
O2	D6	ND																
O2	D8	ND																
O2	D10	ND																
O2	E1	ND																
O2	E3	ND																
O2	E5	ND																
O2	E7	ND																
O2	E9	ND																
O2	F2	ND																
O2	F4	ND																
O2	F6	ND																
O2	F8	ND																
O2	F10	ND																
O2	G1	ND																
O2	G3	ND																
O2	G5	ND																
O2	G7	ND																
O2	G9	ND																
O4	B1	ND																
O4	B3	ND																
O4	B5	ND																
O4	B7	ND																
O4	B9	ND																
O4	E2	ND																
O4	E4	ND																
O4	E6	ND																
O4	E8	ND																
O4	E10	ND																
O4	F1	ND																
O4	F3	ND																
O4	F5	ND																
O4	F7	ND																
O4	F9	ND																
O4	G2	ND																
O4	G4	ND																
O4	G6	ND																
O4	G8	ND																
O4	G10	ND																
O4	H1	ND																
O4	H3	ND																
O4	H5	ND																
O4	H7	ND																
O4	H9	ND																
O4	I2	ND																
O4	I4	ND																
O4	I6	ND																
O4	I8	ND																
O4	I10	ND																
O4	J1	ND																
O4	J3	ND																
O4	J5	ND																
O4	J7	ND																
O4	J9	ND																

LIBBY

TEM Asbestos Structure Count -- ISO 10312

EPA Sample Number BA-00037
Tag AL1
Status ANALYZED
Lab QC Type NOT QC
Lab Sample Number 271300244-0009
Matrix Air
Category Field
Prep Indirect
Analysis Method TEM-ISO
Est. Particulate Loading 5%

PARAMETERS

Effective filter area 360.0 mm²
 F factor 1.25E-01
 Number of Grid Openings (amphibole) 760
 Number of Grid Openings (chrysotile) 760
 Grid opening area 0.013 mm²
 Volume (L) or Area (cm²) 739 L
 Sensitivity (amphibole) 3.94E-04 s/cc
 Sensitivity (chrysotile) 3.94E-04 s/cc
 Area Examined (amphibole) 9.880 mm²
 Area Examined (chrysotile) 9.880 mm²

Magnification: LOW

Recording Rules:

Min AR	Min length (um)	Min width (um)
3:1	5	0.25

Stopping Rules:

Target Sens.	Max AE (mm ²)	Max N LA
0.0004	10.000	25

COUNTS (based on countable structures only)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0	0	0	0

CONCENTRATION (s/cc)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total: Length > 0.5 um, Aspect Ratio >= 3:1

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

Chi-sq test for filter loading --

p value: 1.0E+00

interpretation: OK

LIBBY

TEM Asbestos Structure Count

Laboratory ID:	EML27		EPA Sample Number:	BA-00037	Tag	AL1	
Instrument ID	OL 100 CX II (27-2)		Matrix	Air			
Voltage (KV)	100		Air volume (L), dust sample area (cm ²), or dustfall container area (cm ²):	739			
Magnification (do not include X)	4,800	LOW	Date received by lab	5/21/2013			
Grid opening area (mm ²)	0.0130		Lab Job Number:	271300244			
Scale: 1L =	1.000		Lab Sample Number:	271300244-0009			
Scale: 1D =	1.000		Number of grids prepared	10			
Primary filter area (mm ²)	385.0		Prepared by (e.g., M. Smith)	E. Wyatt-Pescador			
Secondary Filter Area (mm ²)	360.0		Preparation date	4/15/2009			
Category	Field		EPA COC Number	0412-003			
Filter Status	ANALYZED		Estimated Particulate Loading (%)	5%			

Analyzed by (e.g., M. Smith)	E. Wyatt-Pescador	
Analysis date	6/25/2013	
Prep	Indirect	
If sample type = air, is there loose material or debris in the cow?	No	
Analysis Method	TEM-ISO	
Analysis Method SOP	ISO 10312	
Grid storage location	2713-LIB-56	
Archive filter(s) storage location	ESAT Archive	
Enter the appropriate data in the cells to the right to calculate the F-factor >>>>		
F- factor	0.125	
Lab QC Type	NOT QC	

Recording Rules:

3:1	Minimum Aspect Ratio
5.00	Minimum Length (um)
0.25	Minimum Width (um)

Stopping Rules:

0.00040	Target Sensitivity
750	GOs required to reach target
10.000	Maximum Area Examined (mm ²)
770	GOs required to reach max area
25	Maximum # of Structures
750	Estimated # of GOs required

F-factor Calculation:

Indirect Prep Inputs

0.5	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
100	First resuspension volume or rinsate volume (mL)
25	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

0.125 F-factor

Grid opening traverse direction:	V
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Supplemental Air Analysis

☐ Check box if supplemental analysisAchieved sensitivity (cc⁻¹) from the original analysis

Note: When the box is checked above, the est. # of GOs required that is calculated will automatically take into account the GOs examined during the original analysis.

COMMENTS

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LIBBY
TEM Asbestos Structure Count

0412-003_BA-00037_271300244-0009_TEM-ISO_AR_06-25-13_I_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00037
 LAB SAMPLE ID: 271300244-0009

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Indirect
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/26/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q2	A1	ND																
Q2	A2	ND																
Q2	A3	ND																
Q2	A4	ND																
Q2	A5	ND																
Q2	A6	ND																
Q2	A7	ND																
Q2	A8	ND																
Q2	A9	ND																
Q2	A10	ND																
Q2	B1	ND																
Q2	B2	ND																
Q2	B3	ND																
Q2	B4	ND																
Q2	B5	ND																
Q2	B6	ND																
Q2	B7	ND																
Q2	B8	ND																
Q2	B9	ND																
Q2	B10	ND																
Q2	C1	ND																
Q2	C2	ND																
Q2	C3	ND																
Q2	C4	ND																
Q2	C5	ND																
Q2	C6	ND																
Q2	C7	ND																
Q2	C8	ND																
Q2	C9	ND																
Q2	C10	ND																
Q2	D1	ND																
Q2	D2	ND																
Q2	D3	ND																
Q2	D4	ND																
Q2	D5	ND																
Q2	D6	ND																
Q2	D7	ND																
Q2	D8	ND																
Q2	D9	ND																
Q2	D10	ND																
Q2	E1	ND																
Q2	E2	ND																
Q2	E3	ND																
Q2	E4	ND																
Q2	E5	ND																
Q2	E6	ND																
Q2	E7	ND																
Q2	E8	ND																
Q2	E9	ND																
Q2	E10	ND																
Q2	F1	ND																
Q2	F2	ND																
Q2	F3	ND																
Q2	F4	ND																
Q2	F5	ND																
Q2	F6	ND																
Q2	F7	ND																
Q2	F8	ND																
Q2	F9	ND																
Q2	F10	ND																
Q2	G1	ND																
Q2	G2	ND																
Q2	G3	ND																
Q2	G4	ND																
Q2	G5	ND																
Q2	G6	ND																
Q2	G7	ND																
Q2	G8	ND																
Q2	G9	ND																
Q2	G10	ND																
Q2	H1	ND																
Q2	H2	ND																
Q2	H3	ND																
Q2	H4	ND																
Q2	H5	ND																
Q2	H6	ND																
Q2	H7	ND																
Q2	H8	ND																
Q2	H9	ND																
Q2	H10	ND																
Q2	I1	ND																
Q2	I2	ND																
Q2	I3	ND																40

LIBBY
TEM Asbestos Structure Count

0412-003_BA-00037_271300244-0009_TEM-ISO_AR_06-25-13_I_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00037
 LAB SAMPLE ID: 271300244-0009

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Indirect
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/26/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q2	I4	ND																
Q2	I5	ND																
Q2	I6	ND																
Q2	I7	ND																
Q2	I8	ND																
Q2	I9	ND																
Q2	I10	ND																
Q2	J1	ND																
Q2	J2	ND																
Q2	J3	ND																
Q2	J4	ND																
Q2	J5	ND																
Q2	J6	ND																
Q2	J7	ND																
Q2	J8	ND																
Q2	J9	ND																
Q2	J10	ND																
Q4	A1	ND																
Q4	A2	ND																
Q4	A3	ND																
Q4	A4	ND																
Q4	A5	ND																
Q4	A6	ND																
Q4	A7	ND																
Q4	A8	ND																
Q4	A9	ND																
Q4	A10	ND																
Q4	B1	ND																
Q4	B2	ND																
Q4	B3	ND																
Q4	B4	ND																
Q4	B5	ND																
Q4	B6	ND																
Q4	B7	ND																
Q4	B8	ND																
Q4	B9	ND																
Q4	B10	ND																
Q4	C1	ND																
Q4	C2	ND																
Q4	C3	ND																
Q4	C4	ND																
Q4	C5	ND																
Q4	C6	ND																
Q4	C7	ND																
Q4	C8	ND																
Q4	C9	ND																
Q4	C10	ND																
Q4	D1	ND																
Q4	D2	ND																
Q4	D3	ND																
Q4	D4	ND																
Q4	D5	ND																
Q4	D6	ND																
Q4	D7	ND																
Q4	D8	ND																
Q4	D9	ND																
Q4	D10	ND																
Q4	E1	ND																
Q4	E2	ND																
Q4	E3	ND																
Q4	E4	ND																
Q4	E5	ND																
Q4	E6	ND																
Q4	E7	ND																
Q4	E8	ND																
Q4	E9	ND																
Q4	E10	ND																
Q4	F1	ND																
Q4	F2	ND																
Q4	F3	ND																
Q4	F4	ND																
Q4	F5	ND																
Q4	F6	ND																
Q4	F7	ND																
Q4	F8	ND																
Q4	F9	ND																
Q4	F10	ND																
Q4	G1	ND																
Q4	G2	ND																
Q4	G3	ND																
Q4	G4	ND																
Q4	G5	ND																
Q4	G6	ND																

LIBBY

TEM Asbestos Structure Count

0412-003_BA-00037_271300244-0009_TEM-ISO_AR_06-25-13_I_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00037
LAB SAMPLE ID: 271300244-0009Matrix: Air
Analysis Method: TEM-ISOPrep: Indirect
QC Type: NotQC

ERROR CHECK

OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
Data Entry date: 6/26/2013QA by (e.g., M. Smith): M. Smollock
QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q4	G7	ND																
Q4	G8	ND																
Q4	G9	ND																
Q4	G10	ND																
Q4	H1	ND																
Q4	H2	ND																
Q4	H3	ND																
Q4	H4	ND																
Q4	H5	ND																
Q4	H6	ND																
Q4	H7	ND																
Q4	H8	ND																
Q4	H9	ND																
Q4	H10	ND																
Q4	I1	ND																
Q4	I2	ND																
Q4	I3	ND																
Q4	I4	ND																
Q4	I5	ND																
Q4	I6	ND																
Q4	I7	ND																
Q4	I8	ND																
Q4	I9	ND																
Q4	I10	ND																
Q4	J1	ND																
Q4	J2	ND																
Q4	J3	ND																
Q4	J4	ND																
Q4	J5	ND																
Q4	J6	ND																
Q4	J7	ND																
Q4	J8	ND																
Q4	J9	ND																
Q4	J10	ND																
Q6	A1	ND																
Q6	A2	ND																
Q6	A3	ND																
Q6	A4	ND																
Q6	A5	ND																
Q6	A6	ND																
Q6	A7	ND																
Q6	A8	ND																
Q6	A9	ND																
Q6	A10	ND																
Q6	B1	ND																
Q6	B2	ND																
Q6	B3	ND																
Q6	B4	ND																
Q6	B5	ND																
Q6	B6	ND																
Q6	B7	ND																
Q6	B8	ND																
Q6	B9	ND																
Q6	B10	ND																
Q6	C1	ND																
Q6	C2	ND																
Q6	C3	ND																
Q6	C4	ND																
Q6	C5	ND																
Q6	C6	ND																
Q6	C7	ND																
Q6	C8	ND																
Q6	C9	ND																
Q6	C10	ND																
Q6	D1	ND																
Q6	D2	ND																
Q6	D3	ND																
Q6	D4	ND																
Q6	D5	ND																
Q6	D6	ND																
Q6	D7	ND																
Q6	D8	ND																
Q6	D9	ND																
Q6	D10	ND																
Q6	E1	ND																
Q6	E2	ND																
Q6	E3	ND																
Q6	E4	ND																
Q6	E5	ND																
Q6	E6	ND																
Q6	E7	ND																
Q6	E8	ND																
Q6	E9	ND																42

LIBBY
TEM Asbestos Structure Count

0412-003_BA-00037_271300244-0009_TEM-ISO_AR_06-25-13_I_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00037
 LAB SAMPLE ID: 271300244-0009

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Indirect
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/26/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q6	E10	ND																
Q6	F1	ND																
Q6	F2	ND																
Q6	F3	ND																
Q6	F4	ND																
Q6	F5	ND																
Q6	F6	ND																
Q6	F7	ND																
Q6	F8	ND																
Q6	F9	ND																
Q6	F10	ND																
Q6	G1	ND																
Q6	G2	ND																
Q6	G3	ND																
Q6	G4	ND																
Q6	G5	ND																
Q6	G6	ND																
Q6	G7	ND																
Q6	G8	ND																
Q6	G9	ND																
Q6	G10	ND																
Q6	H1	ND																
Q6	H2	ND																
Q6	H3	ND																
Q6	H4	ND																
Q6	H5	ND																
Q6	H6	ND																
Q6	H7	ND																
Q6	H8	ND																
Q6	H9	ND																
Q6	H10	ND																
Q6	I1	ND																
Q6	I2	ND																
Q6	I3	ND																
Q6	I4	ND																
Q6	I5	ND																
Q6	I6	ND																
Q6	I7	ND																
Q6	I8	ND																
Q6	I9	ND																
Q6	I10	ND																
Q6	J1	ND																
Q6	J2	ND																
Q6	J3	ND																
Q6	J4	ND																
Q6	J5	ND																
Q6	J6	ND																
Q6	J7	ND																
Q6	J8	ND																
Q6	J9	ND																
Q6	J10	ND																
Q8	A1	ND																
Q8	A2	ND																
Q8	A3	ND																
Q8	A4	ND																
Q8	A5	ND																
Q8	A6	ND																
Q8	A7	ND																
Q8	A8	ND																
Q8	A9	ND																
Q8	A10	ND																
Q8	B1	ND																
Q8	B2	ND																
Q8	B3	ND																
Q8	B4	ND																
Q8	B5	ND																
Q8	B6	ND																
Q8	B7	ND																
Q8	B8	ND																
Q8	B9	ND																
Q8	B10	ND																
Q8	C1	ND																
Q8	C2	ND																
Q8	C3	ND																
Q8	C4	ND																
Q8	C5	ND																
Q8	C6	ND																
Q8	C7	ND																
Q8	C8	ND																
Q8	C9	ND																
Q8	C10	ND																
Q8	D1	ND																
Q8	D2	ND																

LIBBY
TEM Asbestos Structure Count

0412-003_BA-00037_271300244-0009_TEM-ISO_AR_06-25-13_I_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00037
 LAB SAMPLE ID: 271300244-0009

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Indirect
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/26/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q8	D3	ND																
Q8	D4	ND																
Q8	D5	ND																
Q8	D6	ND																
Q8	D7	ND																
Q8	D8	ND																
Q8	D9	ND																
Q8	D10	ND																
Q8	E1	ND																
Q8	E2	ND																
Q8	E3	ND																
Q8	E4	ND																
Q8	E5	ND																
Q8	E6	ND																
Q8	E7	ND																
Q8	E8	ND																
Q8	E9	ND																
Q8	E10	ND																
Q8	F1	ND																
Q8	F2	ND																
Q8	F3	ND																
Q8	F4	ND																
Q8	F5	ND																
Q8	F6	ND																
Q8	F7	ND																
Q8	F8	ND																
Q8	F9	ND																
Q8	F10	ND																
Q8	G1	ND																
Q8	G2	ND																
Q8	G3	ND																
Q8	G4	ND																
Q8	G5	ND																
Q8	G6	ND																
Q8	G7	ND																
Q8	G8	ND																
Q8	G9	ND																
Q8	G10	ND																
Q8	H1	ND																
Q8	H2	ND																
Q8	H3	ND																
Q8	H4	ND																
Q8	H5	ND																
Q8	H6	ND																
Q8	H7	ND																
Q8	H8	ND																
Q8	H9	ND																
Q8	H10	ND																
Q8	I1	ND																
Q8	I2	ND																
Q8	I3	ND																
Q8	I4	ND																
Q8	I5	ND																
Q8	I6	ND																
Q8	I7	ND																
Q8	I8	ND																
Q8	I9	ND																
Q8	I10	ND																
Q8	J1	ND																
Q8	J2	ND																
Q8	J3	ND																
Q8	J4	ND																
Q8	J5	ND																
Q8	J6	ND																
Q8	J7	ND																
Q8	J8	ND																
Q8	J9	ND																
Q8	J10	ND																
Q10	B1	ND																
Q10	B2	ND																
Q10	B3	ND																
Q10	B4	ND																
Q10	B5	ND																
Q10	B6	ND																
Q10	B7	ND																
Q10	B8	ND																
Q10	B9	ND																
Q10	B10	ND																
Q10	C1	ND																
Q10	C2	ND																
Q10	C3	ND																
Q10	C4	ND																
Q10	C5	ND																

LIBBY
TEM Asbestos Structure Count

0412-003_BA-00037_271300244-0009_TEM-ISO_AR_06-25-13_I_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00037
 LAB SAMPLE ID: 271300244-0009

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Indirect
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/26/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q10	C6	ND																
Q10	C7	ND																
Q10	C8	ND																
Q10	C9	ND																
Q10	C10	ND																
Q10	D1	ND																
Q10	D2	ND																
Q10	D3	ND																
Q10	D4	ND																
Q10	D5	ND																
Q10	D6	ND																
Q10	D7	ND																
Q10	D8	ND																
Q10	D9	ND																
Q10	D10	ND																
Q10	E1	ND																
Q10	E2	ND																
Q10	E3	ND																
Q10	E4	ND																
Q10	E5	ND																
Q10	E6	ND																
Q10	E7	ND																
Q10	E8	ND																
Q10	E9	ND																
Q10	E10	ND																
Q10	F1	ND																
Q10	F2	ND																
Q10	F3	ND																
Q10	F4	ND																
Q10	F5	ND																
Q10	F6	ND																
Q10	F7	ND																
Q10	F8	ND																
Q10	F9	ND																
Q10	F10	ND																
Q10	G1	ND																
Q10	G2	ND																
Q10	G3	ND																
Q10	G4	ND																
Q10	G5	ND																
Q10	G6	ND																
Q10	G7	ND																
Q10	G8	ND																
Q10	G9	ND																
Q10	G10	ND																
Q10	H1	ND																
Q10	H2	ND																
Q10	H3	ND																
Q10	H4	ND																
Q10	H5	ND																
Q10	H6	ND																
Q10	H7	ND																
Q10	H8	ND																
Q10	H9	ND																
Q10	H10	ND																
Q10	I1	ND																
Q10	I2	ND																
Q10	I3	ND																
Q10	I4	ND																
Q10	I5	ND																
Q10	I6	ND																
Q10	I7	ND																
Q10	I8	ND																
Q10	I9	ND																
Q10	I10	ND																
Q10	J1	ND																
Q10	J2	ND																
Q10	J3	ND																
Q10	J4	ND																
Q10	J5	ND																
Q10	J6	ND																
Q10	J7	ND																
Q10	J8	ND																
Q10	J9	ND																
Q10	J10	ND																
R1	A1	ND																
R1	A2	ND																
R1	A3	ND																
R1	A4	ND																
R1	A5	ND																
R1	A6	ND																
R1	A7	ND																
R1	A8	ND																45

LIBBY
TEM Asbestos Structure Count

0412-003_BA-00037_271300244-0009_TEM-ISO_AR_06-25-13_I_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00037
 LAB SAMPLE ID: 271300244-0009

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Indirect
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/26/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
R1	A9	ND																
R1	A10	ND																
R1	B1	ND																
R1	B2	ND																
R1	B3	ND																
R1	B4	ND																
R1	B5	ND																
R1	B6	ND																
R1	B7	ND																
R1	B8	ND																
R1	B9	ND																
R1	B10	ND																
R1	C1	ND																
R1	C2	ND																
R1	C3	ND																
R1	C4	ND																
R1	C5	ND																
R1	C6	ND																
R1	C7	ND																
R1	C8	ND																
R1	C9	ND																
R1	C10	ND																
R1	D1	ND																
R1	D2	ND																
R1	D3	ND																
R1	D4	ND																
R1	D5	ND																
R1	D6	ND																
R1	D7	ND																
R1	D8	ND																
R1	D9	ND																
R1	D10	ND																
R1	E1	ND																
R1	E2	ND																
R1	E3	ND																
R1	E4	ND																
R1	E5	ND																
R1	E6	ND																
R1	E7	ND																
R1	E8	ND																
R1	E9	ND																
R1	E10	ND																
R1	F1	ND																
R1	F2	ND																
R1	F3	ND																
R1	F4	ND																
R1	F5	ND																
R1	F6	ND																
R1	F7	ND																
R1	F8	ND																
R1	F9	ND																
R1	F10	ND																
R1	G1	ND																
R1	G2	ND																
R1	G3	ND																
R1	G4	ND																
R1	G5	ND																
R1	G6	ND																
R1	G7	ND																
R1	G8	ND																
R1	G9	ND																
R1	G10	ND																
R1	H1	ND																
R1	H2	ND																
R1	H3	ND																
R1	H4	ND																
R1	H5	ND																
R1	H6	ND																
R1	H7	ND																
R1	H8	ND																
R1	H9	ND																
R1	H10	ND																
R1	I1	ND																
R1	I2	ND																
R1	I3	ND																
R1	I4	ND																
R1	I5	ND																
R1	I6	ND																
R1	I7	ND																
R1	I8	ND																
R1	I9	ND																
R1	I10	ND																
R3	A1	ND																46

LIBBY
TEM Asbestos Structure Count

0412-003_BA-00037_271300244-0009_TEM-ISO_AR_06-25-13_I_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00037
 LAB SAMPLE ID: 271300244-0009

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Indirect
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/26/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
R3	A2	ND																
R3	A3	ND																
R3	A4	ND																
R3	A5	ND																
R3	A6	ND																
R3	A7	ND																
R3	A8	ND																
R3	A9	ND																
R3	A10	ND																
R3	B1	ND																
R3	B2	ND																
R3	B3	ND																
R3	B4	ND																
R3	B5	ND																
R3	B6	ND																
R3	B7	ND																
R3	B8	ND																
R3	B9	ND																
R3	B10	ND																
R3	C1	ND																
R3	C2	ND																
R3	C3	ND																
R3	C4	ND																
R3	C5	ND																
R3	C6	ND																
R3	C7	ND																
R3	C8	ND																
R3	C9	ND																
R3	C10	ND																
R3	D1	ND																
R3	D2	ND																
R3	D3	ND																
R3	D4	ND																
R3	D5	ND																
R3	D6	ND																
R3	D7	ND																
R3	D8	ND																
R3	D9	ND																
R3	D10	ND																
R3	E1	ND																
R3	E2	ND																
R3	E3	ND																
R3	E4	ND																
R3	E5	ND																
R3	E6	ND																
R3	E7	ND																
R3	E8	ND																
R3	E9	ND																
R3	E10	ND																
R3	F1	ND																
R3	F2	ND																
R3	F3	ND																
R3	F4	ND																
R3	F5	ND																
R3	F6	ND																
R3	F7	ND																
R3	F8	ND																
R3	F9	ND																
R3	F10	ND																
R3	G1	ND																
R3	G2	ND																
R3	G3	ND																
R3	G4	ND																
R3	G5	ND																
R3	G6	ND																
R3	G7	ND																
R3	G8	ND																
R3	G9	ND																
R3	G10	ND																
R3	H1	ND																
R3	H2	ND																
R3	H3	ND																
R3	H4	ND																
R3	H5	ND																
R3	H6	ND																
R3	H7	ND																
R3	H8	ND																
R3	H9	ND																
R3	H10	ND																
R3	I1	ND																
R3	I2	ND																
R3	I3	ND																
R3	I4	ND																47

LIBBY
TEM Asbestos Structure Count

0412-003_BA-00037_271300244-0009_TEM-ISO_AR_06-25-13_I_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00037
 LAB SAMPLE ID: 271300244-0009

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Indirect
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/26/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
R3	I5	ND																
R3	I6	ND																
R3	I7	ND																
R3	I8	ND																
R3	I9	ND																
R3	I10	ND																
R3	J1	ND																
R3	J2	ND																
R3	J3	ND																
R3	J4	ND																
R3	J5	ND																
R3	J6	ND																
R3	J7	ND																
R3	J8	ND																
R3	J9	ND																
R3	J10	ND																
R5	A1	ND																
R5	A2	ND																
R5	A3	ND																
R5	A4	ND																
R5	A5	ND																
R5	A6	ND																
R5	A7	ND																
R5	A8	ND																
R5	A9	ND																
R5	A10	ND																
R5	B1	ND																
R5	B2	ND																
R5	B3	ND																
R5	B4	ND																
R5	B5	ND																
R5	B6	ND																
R5	B7	ND																
R5	B8	ND																
R5	B9	ND																
R5	B10	ND																
R5	C1	ND																
R5	C2	ND																
R5	C3	ND																
R5	C4	ND																
R5	C5	ND																
R5	C6	ND																
R5	C7	ND																
R5	C8	ND																
R5	C9	ND																
R5	C10	ND																
R5	D1	ND																
R5	D2	ND																
R5	D3	ND																
R5	D4	ND																
R5	D5	ND																
R5	D6	ND																
R5	D7	ND																
R5	D8	ND																
R5	D9	ND																
R5	D10	ND																
R5	E1	ND																
R5	E2	ND																
R5	E3	ND																
R5	E4	ND																
R5	E5	ND																
R5	E6	ND																
R5	E7	ND																
R5	E8	ND																
R5	E9	ND																
R5	E10	ND																
R5	F1	ND																
R5	F2	ND																
R5	F3	ND																
R5	F4	ND																
R5	F5	ND																
R5	F6	ND																
R5	F7	ND																
R5	F8	ND																
R5	F9	ND																
R5	F10	ND																
R5	G1	ND																
R5	G2	ND																
R5	G3	ND																
R5	G4	ND																
R5	G5	ND																
R5	G6	ND																
R5	G7	ND																

LIBBY
TEM Asbestos Structure Count

0412-003_BA-00037_271300244-0009_TEM-ISO_AR_06-25-13_I_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00037
 LAB SAMPLE ID: 271300244-0009

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Indirect
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/26/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
R5	G8	ND																
R5	G9	ND																
R5	G10	ND																
R5	H1	ND																
R5	H2	ND																
R5	H3	ND																
R5	H4	ND																
R5	H5	ND																
R5	H6	ND																
R5	H7	ND																
R5	H8	ND																
R5	H9	ND																
R5	H10	ND																

LIBBY

TEM Asbestos Structure Count -- ISO 10312

EPA Sample Number BA-00038
Tag AL1
Status ANALYZED
Lab QC Type NOT QC
Lab Sample Number 271300244-0010
Matrix Air
Category Field
Prep Indirect
Analysis Method TEM-ISO
Est. Particulate Loading 6%

PARAMETERS

Effective filter area 360.0 mm²
 F factor 2.50E-01
 Number of Grid Openings (amphibole) 320
 Number of Grid Openings (chrysotile) 320
 Grid opening area 0.013 mm²
 Volume (L) or Area (cm²) 890 L
 Sensitivity (amphibole) 3.89E-04 s/cc
 Sensitivity (chrysotile) 3.89E-04 s/cc
 Area Examined (amphibole) 4.160 mm²
 Area Examined (chrysotile) 4.160 mm²

Magnification:	LOW
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**Recording
Rules:**

Min AR	Min length (um)	Min width (um)
3:1	5	0.25

**Stopping
Rules:**

Target Sens.	Max AE (mm ²)	Max N LA
0.0004	10.000	25

COUNTS (based on countable structures only)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0	0	0	0

CONCENTRATION (s/cc)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total: Length > 0.5 um, Aspect Ratio >= 3:1

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

Chi-sq test for filter loading --

p value: 1.0E+00

interpretation: OK

LIBBY

TEM Asbestos Structure Count

Laboratory ID:	EMSL27		EPA Sample Number:	BA-00038	Tag	AL1	
Instrument ID	OL 100 CX II (27-2)		Matrix	Air			
Voltage (KV)	100		Air volume (L), dust sample area (cm ²), or dustfall container area (cm ²):	890			
Magnification (do not include X)	4,800	LOW	Date received by lab	5/21/2013			
Grid opening area (mm ²)	0.0130		Lab Job Number:	271300244			
Scale: 1L =	1.000		Lab Sample Number:	271300244-0010			
Scale: 1D =	1.000		Number of grids prepared	10			
Primary filter area (mm ²)	385.0		Prepared by (e.g., M. Smith)	E. Wyatt-Pescador			
Secondary Filter Area (mm ²)	360.0		Preparation date	4/15/2009			
Category	Field		EPA COC Number	0412-003			
Filter Status	ANALYZED		Estimated Particulate Loading (%)	6%			

Analyzed by (e.g., M. Smith)	E. Wyatt-Pescador	
Analysis date	6/24/2013	
Prep	Indirect	
If sample type = air, is there loose material or debris in the bowl?	No	
Analysis Method	TEM-ISO	
Analysis Method SOP	ISO 10312	
Grid storage location	2713-LIB-56	
Archive filter(s) storage location	ESAT Archive	
Enter the appropriate data in the cells to the right to calculate the F-factor >>>>>		
F- factor	0.25	
Lab QC Type	NOT QC	

Recording Rules:

3:1	Minimum Aspect Ratio
5.00	Minimum Length (um)
0.25	Minimum Width (um)

Stopping Rules:

0.00040	Target Sensitivity
312	GOs required to reach target
10.000	Maximum Area Examined (mm ²)
770	GOs required to reach max area
25	Maximum # of Structures
312	Estimated # of GOs required

F-factor Calculation:

Indirect Prep Inputs

0.5	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
100	First resuspension volume or rinsate volume (mL)
50	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

0.25	F-factor
------	----------

Grid opening traverse direction:	V
----------------------------------	---

Supplemental Air Analysis

☐ Check box if supplemental analysis

	Achieved sensitivity (cc ⁻¹) from the original analysis
--	---

Note: When the box is checked above, the est. # of GOs required that is calculated will automatically take into account the GOs examined during the original analysis.

COMMENTS

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LIBBY
TEM Asbestos Structure Count

0412-003_BA-00038_271300244-0010_TEM-ISO_AR_06-24-13_I_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00038
 LAB SAMPLE ID: 271300244-0010

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Indirect
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/26/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
S2	A1	ND																
S2	A2	ND																
S2	A3	ND																
S2	A4	ND																
S2	A5	ND																
S2	A6	ND																
S2	A7	ND																
S2	A8	ND																
S2	A9	ND																
S2	A10	ND																
S2	B1	ND																
S2	B2	ND																
S2	B3	ND																
S2	B4	ND																
S2	B5	ND																
S2	B6	ND																
S2	B7	ND																
S2	B8	ND																
S2	B9	ND																
S2	B10	ND																
S2	C1	ND																
S2	C2	ND																
S2	C3	ND																
S2	C4	ND																
S2	C5	ND																
S2	C6	ND																
S2	C7	ND																
S2	C8	ND																
S2	C9	ND																
S2	C10	ND																
S2	D1	ND																
S2	D2	ND																
S2	D3	ND																
S2	D4	ND																
S2	D5	ND																
S2	D6	ND																
S2	D7	ND																
S2	D8	ND																
S2	D9	ND																
S2	D10	ND																
S2	E1	ND																
S2	E2	ND																
S2	E3	ND																
S2	E4	ND																
S2	E5	ND																
S2	E6	ND																
S2	E7	ND																
S2	E8	ND																
S2	E9	ND																
S2	E10	ND																
S2	F1	ND																
S2	F2	ND																
S2	F3	ND																
S2	F4	ND																
S2	F5	ND																
S2	F6	ND																
S2	F7	ND																
S2	F8	ND																
S2	F9	ND																
S2	F10	ND																
S2	G1	ND																
S2	G2	ND																
S2	G3	ND																
S2	G4	ND																
S2	G5	ND																
S2	G6	ND																
S2	G7	ND																
S2	G8	ND																
S2	G9	ND																
S2	G10	ND																
S2	H1	ND																
S2	H2	ND																
S2	H3	ND																
S2	H4	ND																
S2	H5	ND																
S2	H6	ND																
S2	H7	ND																
S2	H8	ND																
S2	H9	ND																
S2	H10	ND																
S2	I1	ND																
S2	I2	ND																
S2	I3	ND																

LIBBY
TEM Asbestos Structure Count

0412-003_BA-00038_271300244-0010_TEM-ISO_AR_06-24-13_I_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00038
 LAB SAMPLE ID: 271300244-0010

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Indirect
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/26/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
S2	I4	ND																
S2	I5	ND																
S2	I6	ND																
S2	I7	ND																
S2	I8	ND																
S2	I9	ND																
S2	I10	ND																
S2	J1	ND																
S2	J2	ND																
S2	J3	ND																
S2	J4	ND																
S2	J5	ND																
S2	J6	ND																
S2	J7	ND																
S2	J8	ND																
S2	J9	ND																
S2	J10	ND																
S4	A1	ND																
S4	A2	ND																
S4	A3	ND																
S4	A4	ND																
S4	A5	ND																
S4	A6	ND																
S4	A7	ND																
S4	A8	ND																
S4	A9	ND																
S4	A10	ND																
S4	B1	ND																
S4	B2	ND																
S4	B3	ND																
S4	B4	ND																
S4	B5	ND																
S4	B6	ND																
S4	B7	ND																
S4	B8	ND																
S4	B9	ND																
S4	B10	ND																
S4	C1	ND																
S4	C2	ND																
S4	C3	ND																
S4	C4	ND																
S4	C5	ND																
S4	C6	ND																
S4	C7	ND																
S4	C8	ND																
S4	C9	ND																
S4	C10	ND																
S4	D1	ND																
S4	D2	ND																
S4	D3	ND																
S4	D4	ND																
S4	D5	ND																
S4	D6	ND																
S4	D7	ND																
S4	D8	ND																
S4	D9	ND																
S4	D10	ND																
S4	E1	ND																
S4	E2	ND																
S4	E3	ND																
S4	E4	ND																
S4	E5	ND																
S4	E6	ND																
S4	E7	ND																
S4	E8	ND																
S4	E9	ND																
S4	E10	ND																
S4	F1	ND																
S4	F2	ND																
S4	F3	ND																
S4	F4	ND																
S4	F5	ND																
S4	F6	ND																
S4	F7	ND																
S4	F8	ND																
S4	F9	ND																
S4	F10	ND																
S4	G1	ND																
S4	G2	ND																
S4	G3	ND																
S4	G4	ND																
S4	G5	ND																
S4	G6	ND																

LIBBY
TEM Asbestos Structure Count

0412-003_BA-00038_271300244-0010_TEM-ISO_AR_06-24-13_I_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00038
LAB SAMPLE ID: 271300244-0010

Matrix: Air
Analysis Method: TEM-ISO

Prep: Indirect
QC Type: NotQC

ERROR CHECK
OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
Data Entry date: 6/26/2013
QA by (e.g., M. Smith): M. Smollock
QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (e)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
S4	G7	ND																
S4	G8	ND																
S4	G9	ND																
S4	G10	ND																
S4	H1	ND																
S4	H2	ND																
S4	H3	ND																
S4	H4	ND																
S4	H5	ND																
S4	H6	ND																
S4	H7	ND																
S4	H8	ND																
S4	H9	ND																
S4	H10	ND																
S4	I1	ND																
S4	I2	ND																
S4	I3	ND																
S4	I4	ND																
S4	I5	ND																
S4	I6	ND																
S4	I7	ND																
S4	I8	ND																
S4	I9	ND																
S4	I10	ND																
S4	J1	ND																
S4	J2	ND																
S4	J3	ND																
S4	J4	ND																
S4	J5	ND																
S4	J6	ND																
S4	J7	ND																
S4	J8	ND																
S4	J9	ND																
S4	J10	ND																
S6	A1	ND																
S6	A2	ND																
S6	A3	ND																
S6	A4	ND																
S6	A5	ND																
S6	A6	ND																
S6	A7	ND																
S6	A8	ND																
S6	A9	ND																
S6	A10	ND																
S6	B1	ND																
S6	B2	ND																
S6	B3	ND																
S6	B4	ND																
S6	B5	ND																
S6	B6	ND																
S6	B7	ND																
S6	B8	ND																
S6	B9	ND																
S6	B10	ND																
S6	C1	ND																
S6	C2	ND																
S6	C3	ND																
S6	C4	ND																
S6	C5	ND																
S6	C6	ND																
S6	C7	ND																
S6	C8	ND																
S6	C9	ND																
S6	C10	ND																
S6	D1	ND																
S6	D2	ND																
S6	D3	ND																
S6	D4	ND																
S6	D5	ND																
S6	D6	ND																
S6	D7	ND																
S6	D8	ND																
S6	D9	ND																
S6	D10	ND																
S6	E1	ND																
S6	E2	ND																
S6	E3	ND																
S6	E4	ND																
S6	E5	ND																
S6	E6	ND																
S6	E7	ND																
S6	E8	ND																
S6	E9	ND																54

LIBBY
TEM Asbestos Structure Count

0412-003_BA-00038_271300244-0010_TEM-ISO_AR_06-24-13_I_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00038
 LAB SAMPLE ID: 271300244-0010

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Indirect
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/26/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
S6	E10	ND																
S6	F1	ND																
S6	F2	ND																
S6	F3	ND																
S6	F4	ND																
S6	F5	ND																
S6	F6	ND																
S6	F7	ND																
S6	F8	ND																
S6	F9	ND																
S6	F10	ND																
S6	G1	ND																
S6	G2	ND																
S6	G3	ND																
S6	G4	ND																
S6	G5	ND																
S6	G6	ND																
S6	G7	ND																
S6	G8	ND																
S6	G9	ND																
S6	G10	ND																
S6	H1	ND																
S6	H2	ND																
S6	H3	ND																
S6	H4	ND																
S6	H5	ND																
S6	H6	ND																
S6	H7	ND																
S6	H8	ND																
S6	H9	ND																
S6	H10	ND																
S6	I1	ND																
S6	I2	ND																
S6	I3	ND																
S6	I4	ND																
S6	I5	ND																
S6	I6	ND																
S6	I7	ND																
S6	I8	ND																
S6	I9	ND																
S6	I10	ND																
S6	J1	ND																
S6	J2	ND																
S6	J3	ND																
S6	J4	ND																
S6	J5	ND																
S6	J6	ND																
S6	J7	ND																
S6	J8	ND																
S6	J9	ND																
S6	J10	ND																
S8	A1	ND																
S8	A2	ND																
S8	A3	ND																
S8	A4	ND																
S8	A5	ND																
S8	A6	ND																
S8	A7	ND																
S8	A8	ND																
S8	A9	ND																
S8	A10	ND																
S8	B1	ND																
S8	B2	ND																
S8	B3	ND																
S8	B4	ND																
S8	B5	ND																
S8	B6	ND																
S8	B7	ND																
S8	B8	ND																
S8	B9	ND																
S8	B10	ND																

LIBBY

TEM Asbestos Structure Count -- ISO 10312

EPA Sample Number BA-00047
Tag AL1
Status ANALYZED
Lab QC Type NOT QC
Lab Sample Number 271300244-0011
Matrix Air
Category Field
Prep Direct
Analysis Method TEM-ISO
Est. Particulate Loading 5%

PARAMETERS

Effective filter area 385.0 mm2
 F factor 1.00E+00
 Number of Grid Openings (amphibole) 65
 Number of Grid Openings (chrysotile) 65
 Grid opening area 0.013 mm2
 Volume (L) or Area (cm2) 1154 L
 Sensitivity (amphibole) 3.95E-04 s/cc
 Sensitivity (chrysotile) 3.95E-04 s/cc
 Area Examined (amphibole) 0.845 mm2
 Area Examined (chrysotile) 0.845 mm2

Magnification: LOW

Recording Rules:

Min AR	Min length (um)	Min width (um)
3:1	5	0.25

Stopping Rules:

Target Sens.	Max AE (mm ²)	Max N LA
0.0004	10.000	25

COUNTS (based on countable structures only)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0	0	0	0

CONCENTRATION (s/cc)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total: Length > 0.5 um, Aspect Ratio >= 3:1

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

Chi-sq test for filter loading --

p value: 1.0E+00

interpretation: OK

FILE NAME: 0412-003_BA-00047_271300244-0011_TEM-ISO_AR_06-24-13_D_NotQC_C0.xlsm

FILE TYPE: Original

LIBBY

TEM Asbestos Structure Count

Laboratory ID:	EMSL27	▼
Instrument ID	OL 100 CX II (27-2)	
Voltage (KV)	100	
Magnification (do not include X)	4,800	LOW
Grid opening area (mm ²)	0.0130	
Scale: 1L =	1.000	
Scale: 1D =	1.000	
Primary filter area (mm ²)	385.0	
Secondary Filter Area (mm ²)	360.0	
Category	Field	▼
Filter Status	ANALYZED	▼

EPA Sample Number:	BA-00047	Tag	AL1	▼
Matrix	Air		▼	
Air volume (L), dust sample area (cm ²), or dustfall container area (cm ²):	1154			
Date received by lab	5/21/2013			
Lab Job Number:	271300244			
Lab Sample Number:	271300244-0011			
Number of grids prepared	10			
Prepared by (e.g., M. Smith)	D. Barney			
Preparation date	4/15/2009			
EPA COC Number	0412-003			
Estimated Particulate Loading (%)	5%			

Analyzed by (e.g., M. Smith)	E. Wyatt-Pescador	
Analysis date	6/24/2013	
Prep	Direct	▼
If sample type = air, is there loose material or debris in the cowl?	No	▼
Analysis Method	TEM-ISO	
Analysis Method SOP	ISO 10312	
Grid storage location	2713-LIB-57	
Archive filter(s) storage location	ESAT Archive	
F- factor	1	
Lab QC Type	NOT QC	▼

Recording Rules:

3:1	▼	Minimum Aspect Ratio
5.00		Minimum Length (um)
0.25		Minimum Width (um)

Stopping Rules:

0.00040	Target Sensitivity
65	GOs required to reach target
10.000	Maximum Area Examined (mm ²)
770	GOs required to reach max area
25	Maximum # of Structures
65	Estimated # of GOs required

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:	V
----------------------------------	---

Supplemental Air Analysis

☐ Check box if supplemental analysis

Achieved sensitivity (cc⁻¹) from the original analysis

Note: When the box is checked above, the est. # of GOs required that is calculated will automatically take into account the GOs examined during the original analysis.

COMMENTS

Also analyzed on 7/1/2013.

LIBBY
TEM Asbestos Structure Count

0412-003_BA-00047_271300244-0011_TEM-ISO_AR_06-24-13_D_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00047
 LAB SAMPLE ID: 271300244-0011

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Direct
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/25/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/2/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A1	A2	ND																
A1	A4	ND																
A1	A6	ND																
A1	A8	ND																
A1	A10	ND																
A1	B1	ND																
A1	B3	ND																
A1	B5	ND																
A1	B7	ND																
A1	B9	ND																
A1	C2	ND																
A1	C4	ND																
A1	C6	ND																
A1	C8	ND																
A1	C10	ND																
A1	D1	ND																
A1	D3	ND																
A1	D5	ND																
A1	D7	ND																
A1	D9	ND																
A1	E2	ND																
A1	E4	ND																
A1	E6	ND																
A1	E8	ND																
A1	E10	ND																
A1	F1	ND																
A1	F3	ND																
A1	F5	ND																
A1	F7	ND																
A1	F9	ND																
A3	D1	ND																
A3	D3	ND																
A3	D5	ND																
A3	D7	ND																
A3	D9	ND																
A3	E2	ND																
A3	E4	ND																
A3	E6	ND																
A3	E8	ND																
A3	E10	ND																
A3	F1	ND																
A3	F3	ND																
A3	F5	ND																
A3	F7	ND																
A3	F9	ND																
A3	G2	ND																
A3	G4	ND																
A3	G6	ND																
A3	G8	ND																
A3	G10	ND																
A3	H1	ND																
A3	H3	ND																
A3	H5	ND																
A3	H7	ND																
A3	H9	ND																
A3	I2	ND																
A3	I4	ND																
A3	I6	ND																
A3	I8	ND																
A3	I10	ND																
A5	D2	ND																
A5	D4	ND																
A5	D6	ND																
A5	D8	ND																
A5	D10	ND																

LIBBY

TEM Asbestos Structure Count -- ISO 10312

EPA Sample Number BA-00048
Tag AL1
Status ANALYZED
Lab QC Type NOT QC
Lab Sample Number 271300244-0012
Matrix Air
Category Field
Prep Direct
Analysis Method TEM-ISO
Est. Particulate Loading 6%

PARAMETERS

Effective filter area 385.0 mm2
 F factor 1.00E+00
 Number of Grid Openings (amphibole) 65
 Number of Grid Openings (chrysotile) 65
 Grid opening area 0.013 mm2
 Volume (L) or Area (cm2) 1165 L
 Sensitivity (amphibole) 3.91E-04 s/cc
 Sensitivity (chrysotile) 3.91E-04 s/cc
 Area Examined (amphibole) 0.845 mm2
 Area Examined (chrysotile) 0.845 mm2

Magnification:	LOW
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**Recording
Rules:**

Min AR	Min length (um)	Min width (um)
3:1	5	0.25

**Stopping
Rules:**

Target Sens.	Max AE (mm ²)	Max N LA
0.0004	10.000	25

COUNTS (based on countable structures only)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0	0	0	0

CONCENTRATION (s/cc)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total: Length > 0.5 um, Aspect Ratio >= 3:1

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

Chi-sq test for filter loading --

p value: 1.0E+00

interpretation: OK

LIBBY

TEM Asbestos Structure Count

Laboratory ID:	EMSL27		EPA Sample Number:	BA-00048	Tag	AL1	
Instrument ID	OL 100 CX II (27-2)		Matrix	Air			
Voltage (KV)	100		Air volume (L), dust sample area (cm ²), or dustfall container area (cm ²):	1165			
Magnification (do not include X)	4,800	LOW	Date received by lab	5/21/2013			
Grid opening area (mm ²)	0.0130		Lab Job Number:	271300244			
Scale: 1L =	1.000		Lab Sample Number:	271300244-0012			
Scale: 1D =	1.000		Number of grids prepared	10			
Primary filter area (mm ²)	385.0		Prepared by (e.g., M. Smith)	D. Bamey			
Secondary Filter Area (mm ²)	360.0		Preparation date	4/15/2009			
Category	Field		EPA COC Number	0412-003			
Filter Status	ANALYZED		Estimated Particulate Loading (%)	6%			

Analyzed by (e.g., M. Smith)	E. Wyatt-Pescador	
Analysis date	6/24/2013	
Prep	Direct	
If sample type = air, is there loose material or debris in the bowl?	No	
Analysis Method	TEM-ISO	
Analysis Method SOP	ISO 10312	
Grid storage location	2713-LIB-57	
Archive filter(s) storage location	ESAT Archive	
F- factor	1	
Lab QC Type	NOT QC	

Recording Rules:

3:1	Minimum Aspect Ratio
5.00	Minimum Length (um)
0.25	Minimum Width (um)

Stopping Rules:

0.00040	Target Sensitivity
64	GOs required to reach target
10.000	Maximum Area Examined (mm ²)
770	GOs required to reach max area
25	Maximum # of Structures
64	Estimated # of GOs required

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

V

Supplemental Air Analysis

☐ Check box if supplemental analysis

Achieved sensitivity (cc⁻¹) from the original analysis

Note: When the box is checked above, the est. # of GOs required that is calculated will automatically take into account the GOs examined during the original analysis.

COMMENTS

Also analyzed on 7/1/2013.

LIBBY
TEM Asbestos Structure Count

0412-003_BA-00048_271300244-0012_TEM-ISO_AR_06-24-13_D_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00048
 LAB SAMPLE ID: 271300244-0012

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Direct
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/25/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/2/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
C1	A2	ND																
C1	A4	ND																
C1	A6	ND																
C1	A8	ND																
C1	A10	ND																
C1	B1	ND																
C1	B3	ND																
C1	B5	ND																
C1	B7	ND																
C1	B9	ND																
C1	D2	ND																
C1	D4	ND																
C1	D6	ND																
C1	D8	ND																
C1	D10	ND																
C1	E1	ND																
C1	E3	ND																
C1	E5	ND																
C1	E7	ND																
C1	E9	ND																
C1	F2	ND																
C1	F4	ND																
C1	F6	ND																
C1	F8	ND																
C1	F10	ND																
C1	G1	ND																
C1	G3	ND																
C1	G5	ND																
C1	G7	ND																
C1	G9	ND																
C3	C1	ND																
C3	C3	ND																
C3	C5	ND																
C3	C7	ND																
C3	C9	ND																
C3	D2	ND																
C3	D4	ND																
C3	D6	ND																
C3	D8	ND																
C3	D10	ND																
C3	F1	ND																
C3	F3	ND																
C3	F5	ND																
C3	F7	ND																
C3	F9	ND																
C3	G2	ND																
C3	G4	ND																
C3	G6	ND																
C3	G8	ND																
C3	G10	ND																
C3	H1	ND																
C3	H3	ND																
C3	H5	ND																
C3	H7	ND																
C3	H9	ND																
C3	J2	ND																
C3	J4	ND																
C3	J6	ND																
C3	J8	ND																
C3	J10	ND																
C5	G2	ND																
C5	G4	ND																
C5	G6	ND																
C5	G8	ND																
C5	G10	ND																

LIBBY

TEM Asbestos Structure Count -- ISO 10312

EPA Sample Number BA-00058
Tag AL1
Status ANALYZED
Lab QC Type NOT QC
Lab Sample Number 271300244-0013
Matrix Air
Category Field
Prep Direct
Analysis Method TEM-ISO
Est. Particulate Loading 3%

PARAMETERS
 Effective filter area 385.0 mm2
 F factor 1.00E+00
 Number of Grid Openings (amphibole) 146
 Number of Grid Openings (chrysotile) 146
 Grid opening area 0.013 mm2
 Volume (L) or Area (cm2) 510 L
 Sensitivity (amphibole) 3.98E-04 s/cc
 Sensitivity (chrysotile) 3.98E-04 s/cc
 Area Examined (amphibole) 1.898 mm2
 Area Examined (chrysotile) 1.898 mm2

Magnification:	LOW
-----------------------	-----

Recording Rules:

Min AR	Min length (um)	Min width (um)
3:1	5	0.25

Stopping Rules:

Target Sens.	Max AE (mm ²)	Max N LA
0.0004	10.000	25

COUNTS (based on countable structures only)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0	0	0	0

CONCENTRATION (s/cc)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total: Length > 0.5 um, Aspect Ratio >= 3:1

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

Chi-sq test for filter loading --

p value: 1.0E+00

interpretation: OK

LIBBY

TEM Asbestos Structure Count

Laboratory ID:	EML27		EPA Sample Number:	BA-00058	Tag	AL1	
Instrument ID	OL 100 CX II (27-2)		Matrix	Air			
Voltage (KV)	100		Air volume (L), dust sample area (cm ²), or dustfall container area (cm ²):	510			
Magnification (do not include X)	4,800	LOW	Date received by lab	5/21/2013			
Grid opening area (mm ²)	0.0130		Lab Job Number:	271300244			
Scale: 1L =	1.000		Lab Sample Number:	271300244-0013			
Scale: 1D =	1.000		Number of grids prepared	10			
Primary filter area (mm ²)	385.0		Prepared by (e.g., M. Smith)	D. Barney			
Secondary Filter Area (mm ²)	360.0		Preparation date	4/15/2009			
Category	Field		EPA COC Number	0412-003			
Filter Status	ANALYZED		Estimated Particulate Loading (%)	3%			

Analyzed by (e.g., M. Smith)	E. Wyatt-Pescador
Analysis date	6/24/2013
Prep	Direct
If sample type = air, is there loose material or debris in the cow?	No
Analysis Method	TEM-ISO
Analysis Method SOP	ISO 10312
Grid storage location	2713-LIB-57
Archive filter(s) storage location	ESAT Archive
F- factor	1
Lab QC Type	NOT QC

Recording Rules:

3:1	Minimum Aspect Ratio
5.00	Minimum Length (um)
0.25	Minimum Width (um)

Stopping Rules:

0.00040	Target Sensitivity
146	GOs required to reach target
10.000	Maximum Area Examined (mm ²)
770	GOs required to reach max area
25	Maximum # of Structures
146	Estimated # of GOs required

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

V

Supplemental Air Analysis

☐ Check box if supplemental analysis

Achieved sensitivity (cc⁻¹) from the original analysis

Note: When the box is checked above, the est. # of GOs required that is calculated will automatically take into account the GOs examined during the original analysis.

COMMENTS

Also analyzed on 7/1/2013.

LIBBY
TEM Asbestos Structure Count

0412-003_BA-00058_271300244-0013_TEM-ISO_AR_06-24-13_D_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00058
 LAB SAMPLE ID: 271300244-0013

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Direct
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/25/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/2/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
E1	A1	ND																
E1	A2	ND																
E1	A3	ND																
E1	A4	ND																
E1	A5	ND																
E1	A6	ND																
E1	A7	ND																
E1	A8	ND																
E1	A9	ND																
E1	A10	ND																
E1	B1	ND																
E1	B2	ND																
E1	B3	ND																
E1	B4	ND																
E1	B5	ND																
E1	B6	ND																
E1	B7	ND																
E1	B8	ND																
E1	B9	ND																
E1	B10	ND																
E1	C1	ND																
E1	C2	ND																
E1	C3	ND																
E1	C4	ND																
E1	C5	ND																
E1	C6	ND																
E1	C7	ND																
E1	C8	ND																
E1	C9	ND																
E1	C10	ND																
E1	D1	ND																
E1	D2	ND																
E1	D3	ND																
E1	D4	ND																
E1	D5	ND																
E1	D6	ND																
E1	D7	ND																
E1	D8	ND																
E1	D9	ND																
E1	D10	ND																
E1	E1	ND																
E1	E2	ND																
E1	E3	ND																
E1	E4	ND																
E1	E5	ND																
E1	E6	ND																
E1	E7	ND																
E1	E8	ND																
E1	E9	ND																
E1	E10	ND																
E1	F1	ND																
E1	F2	ND																
E1	F3	ND																
E1	F4	ND																
E1	F5	ND																
E1	F6	ND																
E1	F7	ND																
E1	F8	ND																
E1	F9	ND																
E1	F10	ND																
E1	G1	ND																
E1	G2	ND																
E1	G3	ND																
E1	G4	ND																
E1	G5	ND																
E1	G6	ND																
E1	G7	ND																
E1	G8	ND																
E1	G9	ND																
E1	G10	ND																
E3	A1	ND																
E3	A2	ND																
E3	A3	ND																
E3	A4	ND																
E3	A5	ND																
E3	A6	ND																
E3	A7	ND																
E3	A8	ND																
E3	A9	ND																
E3	A10	ND																
E3	B1	ND																
E3	B2	ND																
E3	B3	ND																

LIBBY
TEM Asbestos Structure Count

0412-003_BA-00058_271300244-0013_TEM-ISO_AR_06-24-13_D_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00058
 LAB SAMPLE ID: 271300244-0013

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Direct
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/25/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/2/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
E3	B4	ND																
E3	B5	ND																
E3	B6	ND																
E3	B7	ND																
E3	B8	ND																
E3	B9	ND																
E3	B10	ND																
E3	C1	ND																
E3	C2	ND																
E3	C3	ND																
E3	C4	ND																
E3	C5	ND																
E3	C6	ND																
E3	C7	ND																
E3	C8	ND																
E3	C9	ND																
E3	C10	ND																
E3	D1	ND																
E3	D2	ND																
E3	D3	ND																
E3	D4	ND																
E3	D5	ND																
E3	D6	ND																
E3	D7	ND																
E3	D8	ND																
E3	D9	ND																
E3	D10	ND																
E3	E1	ND																
E3	E2	ND																
E3	E3	ND																
E3	E4	ND																
E3	E5	ND																
E3	E6	ND																
E3	E7	ND																
E3	E8	ND																
E3	E9	ND																
E3	E10	ND																
E3	F1	ND																
E3	F2	ND																
E3	F3	ND																
E3	F4	ND																
E3	F5	ND																
E3	F6	ND																
E3	F7	ND																
E3	F8	ND																
E3	F9	ND																
E3	F10	ND																
E3	G1	ND																
E3	G2	ND																
E3	G3	ND																
E3	G4	ND																
E3	G5	ND																
E3	G6	ND																
E3	G7	ND																
E3	G8	ND																
E3	G9	ND																
E3	G10	ND																
E5	B2	ND																
E5	B4	ND																
E5	B6	ND																
E5	B8	ND																
E5	B10	ND																
E5	C1	ND																

LIBBY

TEM Asbestos Structure Count -- ISO 10312

EPA Sample Number BA-00059
Tag AL1
Status ANALYZED
Lab QC Type NOT QC
Lab Sample Number 271300244-0014
Matrix Air
Category Field
Prep Direct
Analysis Method TEM-ISO
Est. Particulate Loading 2%

PARAMETERS

Effective filter area 385.0 mm2
F factor 1.00E+00
Number of Grid Openings (amphibole) 148
Number of Grid Openings (chrysotile) 148
Grid opening area 0.013 mm2
Volume (L) or Area (cm2) 501 L
Sensitivity (amphibole) 3.99E-04 s/cc
Sensitivity (chrysotile) 3.99E-04 s/cc
Area Examined (amphibole) 1.924 mm2
Area Examined (chrysotile) 1.924 mm2

Magnification: **LOW**

Recording Rules:

Min AR	Min length (um)	Min width (um)
3:1	5	0.25

Stopping Rules:

Target Sens.	Max AE (mm ²)	Max N LA
0.0004	10.000	25

COUNTS (based on countable structures only)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0	0	0	0

CONCENTRATION (s/cc)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total: Length > 0.5 um, Aspect Ratio >= 3:1

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

Chi-sq test for filter loading --

p value: 1.0E+00

interpretation: OK

LIBBY

TEM Asbestos Structure Count

Laboratory ID:	EMSL27	▼	EPA Sample Number:	BA-00059	Tag	AL1	▼
Instrument ID	OL 100 CX II (27-2)		Matrix	Air			▼
Voltage (KV)	100		Air volume (L), dust sample area (cm ²), or dustfall container area (cm ²):	501			
Magnification (do not include X)	4,800	LOW	Date received by lab	5/21/2013			
Grid opening area (mm ²)	0.0130		Lab Job Number:	271300244			
Scale: 1L =	1.000		Lab Sample Number:	271300244-0014			
Scale: 1D =	1.000		Number of grids prepared	10			
Primary filter area (mm ²)	385.0		Prepared by (e.g., M. Smith)	D. Bamey			
Secondary Filter Area (mm ²)	360.0		Preparation date	4/15/2009			
Category	Field	▼	EPA COC Number	0412-003			
Filter Status	ANALYZED	▼	Estimated Particulate Loading (%)	2%			

Analyzed by (e.g., M. Smith)	E. Wyatt-Pescador	
Analysis date	6/24/2013	
Prep	Direct	▼
If sample type = air, is there loose material or debris in the cowl?	No	▼
Analysis Method	TEM-ISO	▼
Analysis Method SOP	ISO 10312	
Grid storage location	2713-LIB-57	
Archive filter(s) storage location	ESAT Archive	
F- factor	1	
Lab QC Type	NOT QC	▼

Recording Rules:

3:1	▼	Minimum Aspect Ratio
5.00		Minimum Length (um)
0.25		Minimum Width (um)

Stopping Rules:

0.00040	Target Sensitivity
148	GOs required to reach target
10.000	Maximum Area Examined (mm ²)
770	GOs required to reach max area
25	Maximum # of Structures
148	Estimated # of GOs required

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
First resuspension volume or insate volume (mL)
Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)
Volume applied to secondary filter (mL) or used for serial dilution
Third resuspension volume (mL)
Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing
--

F-factor

Grid opening traverse direction:	V
----------------------------------	---

Supplemental Air Analysis

☐ Check box if supplemental analysisAchieved sensitivity (cc⁻¹) from the original analysis

Note: When the box is checked above, the est. # of GOs required that is calculated will automatically take into account the GOs examined during the original analysis.

COMMENTS

Also analyzed on 7/1/2013.

LIBBY
TEM Asbestos Structure Count

0412-003_BA-00059_271300244-0014_TEM-ISO_AR_06-24-13_D_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00059
 LAB SAMPLE ID: 271300244-0014

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Direct
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/26/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/2/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
G1	B1	ND																
G1	B2	ND																
G1	B3	ND																
G1	B4	ND																
G1	B5	ND																
G1	B6	ND																
G1	B7	ND																
G1	B8	ND																
G1	B9	ND																
G1	B10	ND																
G1	C1	ND																
G1	C2	ND																
G1	C3	ND																
G1	C4	ND																
G1	C5	ND																
G1	C6	ND																
G1	C7	ND																
G1	C8	ND																
G1	C9	ND																
G1	C10	ND																
G1	D1	ND																
G1	D2	ND																
G1	D3	ND																
G1	D4	ND																
G1	D5	ND																
G1	D6	ND																
G1	D7	ND																
G1	D8	ND																
G1	D9	ND																
G1	D10	ND																
G1	E1	ND																
G1	E2	ND																
G1	E3	ND																
G1	E4	ND																
G1	E5	ND																
G1	E6	ND																
G1	E7	ND																
G1	E8	ND																
G1	E9	ND																
G1	E10	ND																
G1	F1	ND																
G1	F2	ND																
G1	F3	ND																
G1	F4	ND																
G1	F5	ND																
G1	F6	ND																
G1	F7	ND																
G1	F8	ND																
G1	F9	ND																
G1	F10	ND																
G1	G1	ND																
G1	G2	ND																
G1	G3	ND																
G1	G4	ND																
G1	G5	ND																
G1	G6	ND																
G1	G7	ND																
G1	G8	ND																
G1	G9	ND																
G1	G10	ND																
G1	H1	ND																
G1	H2	ND																
G1	H3	ND																
G1	H4	ND																
G1	H5	ND																
G1	H6	ND																
G1	H7	ND																
G1	H8	ND																
G1	H9	ND																
G1	H10	ND																
G3	C1	ND																
G3	C2	ND																
G3	C3	ND																
G3	C4	ND																
G3	C5	ND																
G3	C6	ND																
G3	C7	ND																
G3	C8	ND																
G3	C9	ND																
G3	C10	ND																
G3	D1	ND																
G3	D2	ND																
G3	D3	ND																

LIBBY
TEM Asbestos Structure Count

0412-003_BA-00059_271300244-0014_TEM-ISO_AR_06-24-13_D_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00059
 LAB SAMPLE ID: 271300244-0014

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Direct
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/26/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/2/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
G3	D4	ND																
G3	D5	ND																
G3	D6	ND																
G3	D7	ND																
G3	D8	ND																
G3	D9	ND																
G3	D10	ND																
G3	E1	ND																
G3	E2	ND																
G3	E3	ND																
G3	E4	ND																
G3	E5	ND																
G3	E6	ND																
G3	E7	ND																
G3	E8	ND																
G3	E9	ND																
G3	E10	ND																
G3	F1	ND																
G3	F2	ND																
G3	F3	ND																
G3	F4	ND																
G3	F5	ND																
G3	F6	ND																
G3	F7	ND																
G3	F8	ND																
G3	F9	ND																
G3	F10	ND																
G3	G1	ND																
G3	G2	ND																
G3	G3	ND																
G3	G4	ND																
G3	G5	ND																
G3	G6	ND																
G3	G7	ND																
G3	G8	ND																
G3	G9	ND																
G3	G10	ND																
G3	H1	ND																
G3	H2	ND																
G3	H3	ND																
G3	H4	ND																
G3	H5	ND																
G3	H6	ND																
G3	H7	ND																
G3	H8	ND																
G3	H9	ND																
G3	H10	ND																
G3	I1	ND																
G3	I2	ND																
G3	I3	ND																
G3	I4	ND																
G3	I5	ND																
G3	I6	ND																
G3	I7	ND																
G3	I8	ND																
G3	I9	ND																
G3	I10	ND																
G5	A1	ND																
G5	A3	ND																
G5	A5	ND																
G5	A7	ND																
G5	A9	ND																
G5	B2	ND																
G5	B4	ND																
G5	B6	ND																

LIBBY

TEM Asbestos Structure Count -- ISO 10312

EPA Sample Number BA-00012
Tag AL1
Status ANALYZED
Lab QC Type Recount Same
Lab Sample Number 271300244-0004
Matrix Air
Category Field
Prep Direct
Analysis Method TEM-ISO
Est. Particulate Loading 7%

PARAMETERS

Effective filter area 385.0 mm2
F factor 1.00E+00
Number of Grid Openings (amphibole) 10
Number of Grid Openings (chrysotile) 10
Grid opening area 0.013 mm2
Volume (L) or Area (cm2) 687 L
Sensitivity (amphibole) 4.31E-03 s/cc
Sensitivity (chrysotile) 4.31E-03 s/cc
Area Examined (amphibole) 0.130 mm2
Area Examined (chrysotile) 0.130 mm2

Magnification: LOW

Recording Rules:

Min AR	Min length (um)	Min width (um)
3:1	5	0.25

Stopping Rules:

Target Sens.	Max AE (mm ²)	Max N LA
0.0004	10.000	25

COUNTS (based on countable structures only)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0	0	0	0

CONCENTRATION (s/cc)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total: Length > 0.5 um, Aspect Ratio >= 3:1

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

Chi-sq test for filter loading --

p value: 1.0E+00

interpretation: OK

FILE NAME: 0412-003_BA-00012_271300244-0004_TEM-ISO_AR_06-26-13_D_RS_C0.xlsm

FILE TYPE: Original

LIBBY

TEM Asbestos Structure Count

Laboratory ID:	EMSL27	EPA Sample Number:	BA-00012	Tag	AL1
Instrument ID	OL 100 CX II (27-2)	Matrix	Air		
Voltage (KV)	100	Air volume (L), dust sample area (cm ²), or dustfall container area (cm ²):	687		
Magnification (do not include X)	4,800	Date received by lab	5/21/2013		
Grid opening area (mm ²)	0.0130	Lab Job Number:	271300244		
Scale: 1L =	1.000	Lab Sample Number:	271300244-0004		
Scale: 1D =	1.000	Number of grids prepared	10		
Primary filter area (mm ²)	385.0	Prepared by (e.g., M. Smith)	D. Barney		
Secondary Filter Area (mm ²)	360.0	Preparation date	4/15/2009		
Category	Field	EPA COC Number	0412-003		
Filter Status	ANALYZED	Estimated Particulate Loading (%)	7%		

Analyzed by (e.g., M. Smith)	E. Wyatt-Pescador
Analysis date	6/26/2013
Prep	Direct
If sample type = air, is there loose material or debris in the bowl?	No
Analysis Method	TEM-ISO
Analysis Method SOP	ISO 10312
Grid storage location	2713-LIB-56
Archive filter(s) storage location	ESAT Archive
F- factor	1
Lab QC Type	Recount Same

Recording Rules:

3:1	Minimum Aspect Ratio
5.00	Minimum Length (um)
0.25	Minimum Width (um)

Stopping Rules:

0.00040	Target Sensitivity
108	GOs required to reach target
10.000	Maximum Area Examined (mm ²)
770	GOs required to reach max area
25	Maximum # of Structures
108	Estimated # of GOs required

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

V

Supplemental Air Analysis

☐ Check box if supplemental analysisAchieved sensitivity (cc⁻¹) from the original analysis

Note: When the box is checked above, the est. # of GOs required that is calculated will automatically take into account the GOs examined during the original analysis.

COMMENTS

LIBBY
TEM Asbestos Structure Count

0412-003_BA-00012_271300244-0004_TEM-ISO_AR_06-26-13_D_RS_C0.xlsm

EPA SAMPLE ID: BA-00012
 LAB SAMPLE ID: 271300244-0004

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Direct
 QC Type: RS

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): A. Fearfield
 Data Entry date: 7/11/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/11/2013

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
G1	A1	ND																
G1	A3	ND																
G1	A5	ND																
G1	A7	ND																
G1	A9	ND																
G3	A2	ND																
G3	A4	ND																
G3	A6	ND																
G3	A8	ND																
G3	A10	ND																

LIBBY

TEM Asbestos Structure Count -- ISO 10312

EPA Sample Number LQ-00001
Tag AL1
Status ANALYZED
Lab QC Type Lab Blank
Lab Sample Number 271300244
Matrix Air
Category Blank
Prep Direct
Analysis Method TEM-ISO
Est. Particulate Loading 1%

PARAMETERS
Effective filter area 385.0 mm2
F factor 1.00E+00
Number of Grid Openings (amphibole) 10
Number of Grid Openings (chrysotile) 10
Grid opening area 0.013 mm2
Volume (L) or Area (cm2) 0 L
Sensitivity (amphibole) Blank s/cc
Sensitivity (chrysotile) Blank s/cc
Area Examined (amphibole) 0.130 mm2
Area Examined (chrysotile) 0.130 mm2

Magnification: LOW

Recording Rules:

Min AR	Min length (um)	Min width (um)
3:1	5	0.25

Stopping Rules:

Target Sens.	Max AE (mm ²)	Max N LA
	0.100	

COUNTS (based on countable structures only)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0	0	0	0

CONCENTRATION (s/cc)

Bin	LA	OA	CH	All Asbestos
Total				
PCME				

Total: Length > 0.5 um, Aspect Ratio >= 3:1

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

Chi-sq test for filter loading --

p value: 1.0E+00

interpretation: OK

FILE NAME: 0412-003_LQ-00001_271300244_TEM-ISO_AR_06-26-13_D_LB_C0.xlsm

FILE TYPE: Original

LIBBY

TEM Asbestos Structure Count

Laboratory ID:	EMSL27	EPA Sample Number:	LQ-00001	Tag	AL1
Instrument ID	OL 100 CX II (27-2)	Matrix	Air		
Voltage (KV)	100	Air volume (L), dust sample area (cm ²), or dustfall container area (cm ²):			
Magnification (do not include X)	4,800	Date received by lab	6/18/2013		
Grid opening area (mm ²)	0.0130	Lab Job Number:	271300244		
Scale: 1L =	1.000	Lab Sample Number:	271300244		
Scale: 1D =	1.000	Number of grids prepared	3		
Primary filter area (mm ²)	385.0	Prepared by (e.g., M. Smith)	D. Bamey		
Secondary Filter Area (mm ²)	360.0	Preparation date	4/15/2009		
Category	Blank	EPA COC Number	0412-003		
Filter Status	ANALYZED	Estimated Particulate Loading (%)	1%		

Analyzed by (e.g., M. Smith)	E. Wyatt-Pescador	
Analysis date	6/26/2013	
Prep	Direct	
If sample type = air, is there loose material or debris in the cowl?	No	
Analysis Method	TEM-ISO	
Analysis Method SOP	ISO 10312	
Grid storage location	2713-LIB-57	
Archive filter(s) storage location	ESAT Archive	
F- factor	1	
Lab QC Type	Lab Blank	

Recording Rules:

3:1	Minimum Aspect Ratio
5.00	Minimum Length (um)
0.25	Minimum Width (um)

Stopping Rules:

	Target Sensitivity
	GOs required to reach target
0.100	Maximum Area Examined (mm ²)
8	GOs required to reach max area
	Maximum # of Structures
8	Estimated # of GOs required

F-factor Calculation:

Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

F-factor

Grid opening traverse direction:	V
----------------------------------	---

Supplemental Air Analysis

☐ Check box if supplemental analysisAchieved sensitivity (cc⁻¹) from the original analysis

Note: When the box is checked above, the est. # of GOs required that is calculated will automatically take into account the GOs examined during the original analysis.

COMMENTS

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LIBBY
TEM Asbestos Structure Count

0412-003_LQ-00001_271300244_TEM-ISO_AR_06-26-13_D_LB_C0.xlsm

EPA SAMPLE ID: LQ-00001
 LAB SAMPLE ID: 271300244

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Direct
 QC Type: LB

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): A. Fearfield
 Data Entry date: 7/11/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/11/2013

Maximum Area Examined Reached-Complete current GO then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
I1	E2	ND																
I1	E4	ND																
I1	E6	ND																
I1	E8	ND																
I1	E10	ND																
I3	I2	ND																
I3	I4	ND																
I3	I6	ND																
I3	I8	ND																
I3	I10	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID:	EMSL27	
Instrument ID	JEOL 100 CX II (27-2)	
Voltage (KV)	100	
Mag.	4,800 X	HIGH LOW
Grid opening area (mm2)	0.013	
Scale: 1L =	1	
Scale: 1D =	1	
Primary filter area (mm2)	385	
Secondary Filter Area (mm2)	360	
Category (Field, Blank)	Field	
Primary filter pore size (um)	0.8	

EPA Sample Number:	BA-00001	Tag:	AL1
Matrix (A=Air, D=Dust, DF = Dustfall):	A		
Air volume (L), dust area (cm2), or dustfall container area (cm2)	1344		
Date received by lab	5/21/2013		
Lab Job Number:	271300244		
Lab Sample Number:	271300244-0001		
Number of grids prepared	10		
Prepared by	E. Wyatt-Pescador		
Preparation date	4/15/2009		
EPA COC Number:	0412-003		
Secondary filter pore size (um)	0.2		

Analyzed by:	E. Wyatt-Pescador
Analysis date	6/19/2013
Method (D=Direct, I=Indirect, IA=Indirect-ashed)	IA
If sample type = air, is there loose material or debris in the bowl? (Yes, No)	No
Analysis Method (TEM-ISO, TEM-AHERA, TEM-ASTM)	TEM-ISO
Grid storage location	2713-LIB-56
Archive filter(s) storage location	ESAT Archive
Lab QC Type (Not QC, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QC
Estimated Particulate Loading (%)	12

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right----->

Recording Rules:

Minimum Aspect Ratio (circle one):
none ≥ 3:1 ≥ 5:1

Minimum Length (um): 5

Minimum Width (um): 0.25

Stopping Rules:

Target Sensitivity: 0.0004

Max Area Examined: 10

Target # of Structures: 25

F-factor Calculation:

Indirect Prep Inputs

1/2 Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)

100 First resuspension volume or rinse volume (mL)

50 Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

 Second resuspension volume (mL)

 Volume applied to secondary filter (mL) or used for serial dilution

 Third resuspension volume (mL)

 Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

 Fraction of secondary filter used for ashing

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Mineral Desc	EDXA	Sketch/ Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A1	B1	NO																
	B3	NO																
	B5	NO																
	B7	NO																
	B9	NO																
	C2	NO																
	C4	NO																
	C6	NO																
	C8	NO																
	C10	NO																

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

CH = Chrysotile

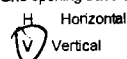
NAM = Non-asbestos material

Are prepped grids acceptable for analysis? (circle one) Yes No
If No, explain:

76 If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below.

Analyzed by:	
Analysis date:	
Instrument:	

Grid opening traverse direction (circle one):



SUPPLEMENTAL AIR ANALYSIS:

 Achieved sensitivity (cc⁻¹) from the original analysis

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00001	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0001	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A1	D1	ND																
	D3	ND																
	D5	ND																
	D7	ND																
	D9	ND																
	E2	ND																
	E4	ND																
	E6	ND																
	E8	ND																
	E10	ND																
	F1	ND																
	F3	ND																
	F5	ND																
	F7	ND																
	F9	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00001	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0001	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A1	G2	ND																
	G4	ND																
	G6	ND																
	G8	ND																
	G10	ND																
	H1	ND																
	H3	ND																
	H5	ND																
	H7	ND																
	H9	ND																
	I2	ND																
	I4	ND																
	I6	ND																
	I8	ND																
	I10	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00001	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0001	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A1	J1	ND																
	J3	ND																
	J5	ND																
	J7	ND																
	J9	ND																
A3	A2	ND																
	A4	ND																
	A6	ND																
	A8	ND																
	A10	ND																
	B1	ND																
	B3	ND																
	B5	ND																
	B7	ND																
	B9	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00001	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0001	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A3	C2	ND																
	C4	ND																
	C6	ND																
	C8	ND																
	C10	ND																
	D1	ND																
	D3	ND																
	D5	ND																
	D7	ND																
	D9	ND																
	E2	ND																
	E4	ND																
	E6	ND																
	E8	ND																
	E10	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00001	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0001	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A3	F1	ND																
	F3	ND																
	F5	ND																
	F7	ND																
	F9	ND																
	G2	ND																
	G4	ND																
	G6	ND																
	G8	ND																
	G10	ND																
	H1	ND																
	H3	ND																
	H5	ND																
	H7	ND																
	H9	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00001	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0001	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A3	I2	ND																
	I4	ND																
	I6	ND																
	I8	ND																
	I10	ND																
	J1	ND																
	J3	ND																
	J5	ND																
	J7	ND																
	J9	ND																
A5	A1	ND																
	A2	ND																
	A3	ND																
	A4	ND																
	A5	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID **EMSL27**
 Lab Sample Number **271300244-0001**

EPA Sample Number **BA-00001**
 Matrix **A**

Lab QC Type **Not QC**
 Analyst Name **E. Wyatt-Pescador**

Lab Job Number **271300244**
 Grid Storage Loc. **2713-LIB-56**

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A5	A6	ND																
	A7	ND																
	A8	ND																
	A9	ND																
	A10	ND																
	B1	ND																
	B2	ND																
	B3	ND																
	B4	ND																
	B5	ND																
	B6	ND																
	B7	ND																
	B8	ND																
	B9	ND																
	B10	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00001	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0001	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A5	C1	ND																
	C2	ND																
	C3	ND																
	C4	ND																
	C5	ND																
	C6	ND																
	C7	ND																
	C8	ND																
	C9	ND																
	C10	ND																
	D1	ND																
	D2	ND																
	D3	ND																
	D4	ND																
	D5	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00001	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0001	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A5	D6	ND																
	D7	ND																
	D8	ND																
	D9	ND																
	D10	ND																
	E1	ND																
	E2	ND																
	E3	ND																
	E4	ND																
	E5	ND																
	E6	ND																
	E7	ND																
	E8	ND																
	E9	ND																
	E10	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00001	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0001	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A5	F1	ND																
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	F4	ND																
	F5	ND																
	F6	ND																
	F7	ND																
	F8	ND																
	F9	ND																
	F10	ND																
	G1	ND																
	G2	ND																
	G3	ND																
	G4	ND																
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TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00001	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0001	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

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Lab Sample Number	271300244-0001	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

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TEM Asbestos Structure Count_Air-DustEDD_38f

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Lab Sample Number	271300244-0001	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

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LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27
Lab Sample Number	271300244-0001

EPA Sample Number	BA-00001
Matrix	A

Lab QC Type	Not QC
Analyst Name	E. Wyatt-Pescador

Lab Job Number	271300244
Grid Storage Loc.	2713-LIB-56

[illegible]

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TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID:	EMSL27
Instrument ID	JEOL 100 CX II (27-2)
Voltage (KV)	100
Mag.	4,800 X
Grid opening area (mm2)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	360
Category (Field, Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00002	Tag:	AL1
Matrix (A=Air, D=Dust, DF = Dustfall):	A		
Air volume (L), dust area (cm2), or dustfall container area (cm2)	1333		
Date received by lab	5/21/2013		
Lab Job Number:	271300244		
Lab Sample Number:	271300244-0002		
Number of grids prepared	10		
Prepared by	E. Wyatt-Pescador		
Preparation date	4/15/2013		
EPA COC Number:	0412-003		
Secondary filter pore size (um)	0.2		

Analyzed by:	E. Wyatt-Pescador
Analysis date	6/19/2013
Method (D=Direct, I=Indirect, IA=Indirect-ashed)	IA
If sample type = air, is there loose material or debris in the bowl? (Yes, No)	No
Analysis Method (TEM-ISO, TEM-AHERA, TEM-ASTM)	TEM-ISO
Grid storage location	2713-LIB-56
Archive filter(s) storage location	ESAT Archive
Lab QC Type (Not QC, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QC
Estimated Particulate Loading (%)	5

F-Factor Calculation (Indirect Preps Only):
Enter data in appropriate cells provided to the right----->

Recording Rules:

Minimum Aspect Ratio (circle one):
none ≥ 3:1 ≥ 5:1

Minimum Length (um): 5.0

Minimum Width (um): 0.25

Stopping Rules:

Target Sensitivity: 0.0004

Max Area Examined: 10

Target # of Structures: 25

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Mineral Desc	EDXA	Sketch/ Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
C1	A1	ND																
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	A5	ND																
	A6	ND																
	A7	ND																
	A8	ND																
	A9	ND																
	A10	ND																

F-factor Calculation:

Indirect Prep Inputs

1/2 Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)

100 First resuspension volume or rinsate volume (mL)

25 Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

 Second resuspension volume (mL)

 Volume applied to secondary filter (mL) or used for serial dilution

 Third resuspension volume (mL)

 Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

 Fraction of secondary filter used for ashing

LA = Libby-type amphibole OA = Other (non-Libby type) amphibole CH = Chrysotile NAM = Non-asbestos material

If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below.

Analyzed by:	
Analysis date:	
Instrument:	

Grid opening traverse direction (circle one):

V Vertical

H Horizontal

Are prepped grids acceptable for analysis? (circle one) Yes No

If No, explain:

SUPPLEMENTAL AIR ANALYSIS:

 Achieved sensitivity (cc⁻¹) from the original analysis

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00002	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0002	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

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	B3	ND																
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	B7	ND																
	B8	ND																
	B9	ND																
	B10	ND																
	C1	ND																
	C2	ND																
	C3	ND																
	C4	ND																
	C5	ND																

LIBBY

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	J5	ND																
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	A2	ND																
	A3	ND																
	A4	ND																
	A5	ND																
	A6	ND																
	A7	ND																
	A8	ND																
	A9	ND																
	A10	ND																
	B1	ND																
	B2	ND																
	B3	ND																
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C3	B6	ND																
	B7	ND																
	BB	ND																
	B9	ND																
	B10	ND																
	C1	ND																
	C2	ND																
	C3	ND																
	C4	ND																
	C5	ND																
	C6	ND																
	C7	ND																
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Laboratory ID

EMSL27

EPA Sample Number

BA-00002

Lab QC Type

Not QC

Lab Job Number

271300244

Lab Sample Number

271300244-0002

Matrix

A

Analyst Name

E. Wyatt-Pescador

Grid Storage Loc.

2713-LIB-56

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	J9	ND																
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Laboratory ID

EMSL27

EPA Sample Number

BA-00002

Lab QC Type

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Lab Job Number

271300244

Lab Sample Number

271300244-0002

Matrix

A

Analyst Name

E. Wyatt-Pescador

Grid Storage Loc.

2713-LIB-56

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	J2	ND																
	J3	ND																
	J4	ND																
	J5	ND																
	J6	ND																
	J7	ND																
	J8	ND																
	J9	ND																
	J10	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00002	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0002	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
C7	A1	ND																
	A2	ND																
	A3	ND																
	A4	ND																
	A5	ND																
	A6	ND																
	A7	ND																
	A8	ND																
	A9	ND																
	A10	ND																
	B1	ND																
	B2	ND																
	B3	ND																
	B4	ND																
	B5	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00002	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0002	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
C7	B6	ND																
	B7	ND																
	B8	ND																
	B9	ND																
	B10	ND																
	C1	ND																
	C2	ND																
	C3	ND																
	C4	ND																
	C5	ND																
	C6	ND																
	C7	ND																
	C8	ND																
	C9	ND																
	C10	ND																

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TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00002	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0002	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
C7	D1	ND																
	D2	ND																
	D3	ND																
	D4	ND																
	D5	ND																
	D6	ND																
	D7	ND																
	D8	ND																
	D9	ND																
	D10	ND																
	E1	ND																
	E2	ND																
	E3	ND																
	E4	ND																
	E5	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00002	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0002	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
C7	E6	ND																
	E7	ND																
	E8	ND																
	E9	ND																
	E10	ND																
	F1	ND																
	F2	ND																
	F3	ND																
	F4	ND																
	F5	ND																
	F6	ND																
	F7	ND																
	F8	ND																
	F9	ND																
	F10	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00002	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0002	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
C7	G1	ND																
	G2	ND																
	G3	ND																
	G4	ND																
	G5	ND																
	G6	ND																
	G7	ND																
	G8	ND																
	G9	ND																
	G10	ND																
	H1	ND																
	H2	ND																
	H3	ND																
	H4	ND																
	H5	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00002	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0002	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
C7	H6	ND																
	H7	ND																
	H8	ND																
	H9	ND																
	H10	ND																
	I1	ND																
	I2	ND																
	I3	ND																
	I4	ND																
	I5	ND																
	I6	ND																
	I7	ND																
	I8	ND																
	I9	ND																
	I10	ND																

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TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00002	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0002	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
C7	J1	NO																
	J2	NO																
	J3	NO																
	J4	NO																
	J5	NO																
	J6	NO																
	J7	NO																
	J8	NO																
	J9	NO																
	J10	NO																
C9	A1	NO																
	A2	NO																
	A3	NO																
	A4	NO																
	A5	NO																

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TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00002	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0002	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
C9	A6	NO																
	A7	NO																
	A8	NO																
	A9	NO																
	A10	NO																
	B1	NO																
	B2	NO																
	B3	NO																
	B4	NO																
	B5	NO																
	B6	NO																
	B7	NO																
	B8	NO																
	B9	NO																
	B10	NO																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00002	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0002	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
C9	C1	ND																
	C2	ND																
	C3	ND																
	C4	ND																
	C5	ND																
	C6	ND																
	C7	ND																
	C8	ND																
	C9	ND																
	C10	ND																
	D1	ND																
	D2	ND																
	D3	ND																
	D4	ND																
	D5	ND																

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TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27
Lab Sample Number	271300244-0002

EPA Sample Number	BA-00002
Matrix	A

Lab QC Type	Not QC
Analyst Name	E. Wyatt-Pescador

Lab Job Number	271300244
Grid Storage Loc.	2713-LIB-56

[illegible]

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TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID:	EMSL27
Instrument ID	JEOL 100 CX II (27-2)
Voltage (KV)	100
Mag.	4,800 X LOW
Grid opening area (mm ²)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	360
Category (Field, Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00011	Tag:	AL1
Matrix (A=Air, D=Dust, DF = Dustfall):	A		
Air volume (L), dust area (cm ²), or dustfall container area (cm ²)	706		
Date received by lab	5/21/2013		
Lab Job Number:	271300244		
Lab Sample Number:	271300244-0003		
Number of grids prepared	10		
Prepared by	D. Barnay		
Preparation date	7/1/2013		
EPA COC Number:	0412-003		
Secondary filter pore size (um)	0.2		

Analyzed by:	E. Wyatt-Pescador
Analysis date	6/20/2013
Method (D=Direct, I=Indirect, IA=Indirect-ashed)	D
If sample type = air, is there loose material or debris in the bowl? (Yes, No)	No
Analysis Method (TEM-ISO, TEM-AHERA, TEM-ASTM)	TEM-ISO
Grid storage location	2713-LIB-56
Archive filter(s) storage location	ESAT Archive
Lab QC Type (Not QC, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QC
Estimated Particulate Loading (%)	6

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right----->

Recording Rules:

Minimum Aspect Ratio (circle one):
 none ≥ 3:1 ≥ 5:1

Minimum Length (um): 5

Minimum Width (um): 0.25

Stopping Rules:

Target Sensitivity: 0.0004

Max Area Examined: 10

Target # of Structures: 25

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Mineral Desc	EDXA	Sketch/ Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
E1	A1	ND																
	A2	ND																
	A3	ND																
	A4	ND																
	A5	ND																
	A6	ND																
	A7	ND																
	A8	ND																
	A9	ND																
	A10	ND																

F-factor Calculation:

Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)
	First resuspension volume or rinse volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

CH = Chrysotile

NAM = Non-asbestos material

Are prepped grids acceptable for analysis? (circle one) Yes No
If No, explain:

If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below.

Grid opening traverse direction (circle one):

H Horizontal
V Vertical

SUPPLEMENTAL AIR ANALYSIS:

	Achieved sensitivity (cc ⁻¹) from the original analysis
--	---

Analyzed by:	EQP
Analysis date:	7/1/2013
Instrument:	27-2

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TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00011	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0003	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
E1	B1	ND																
	B2	ND																
	B3	ND																
	B4	ND																
	B5	ND																
	B6	ND																
	B7	ND																
	B8	ND																
	B9	ND																
	B10	ND																
	C1	ND																
	C2	ND																
	C3	ND																
	C4	ND																
	C5	ND																

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TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00011	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0003	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
E1	C6	ND																
	C7	ND																
	C8	ND																
	C9	ND																
	C10	ND																
	D1	ND																
	D2	ND																
	D3	ND																
	D4	ND																
	D5	ND																
	D6	ND																
	D7	ND																
	D8	ND																
	D9	ND																
	D10	ND																

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TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00011	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0003	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
E1	E1	NO																
	E2	NO																
	E3	NO																
	E4	NO																
	E5	NO																
E3	A1	NO																
	A2	NO																
	A3	NO																
	A4	NO																
	A5	NO																
	A6	NO																
	A7	NO																
	A8	NO																
	A9	NO																
	A10	NO																

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TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EML27	EPA Sample Number	BA-00011	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0003	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
E3	B1	ND																
	B2	ND																
	B3	ND																
	B4	ND																
	B5	ND																
	B6	ND																
	B7	ND																
	B8	ND																
	B9	ND																
	B10	ND																
	C1	ND																
	C2	ND																
	C3	ND																
	C4	ND																
	C5	ND																

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TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00011	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0003	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
E3	C6	ND																
	C7	ND																
	C8	ND																
	C9	ND																
	C10	ND																
	D1	ND																
	D2	ND																
	D3	ND																
	D4	ND																
	D5	ND																
	D6	ND																
	D7	ND																
	D8	ND																
	D9	ND																
	D10	ND																

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TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00011	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0003	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
E3	E1	ND																
	E2	ND																
	E3	ND																
	E4	ND																
	E5	ND																
	E6	ND																
	E7	ND																
	E8	ND																
	E9	ND																
	E10	ND																
	F1	ND																
	F2	ND																
	F3	ND																
	F4	ND																
	F5	ND																

[illegible]

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TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID:	EMSL27
Instrument ID	JEOL 100 CX II (27-2)
Voltage (KV)	100
Mag.	4,800 X HIGH LOW
Grid opening area (mm ²)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	360
Category (Field, Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00012	Tag:	AL1
Matrix (A=Air, D=Dust, DF = Dustfall):	A		
Air volume (L), dust area (cm ²), or dustfall container area (cm ²)	687		
Date received by lab	5/21/2013		
Lab Job Number:	271300244		
Lab Sample Number:	271300244-0004		
Number of grids prepared	10		
Prepared by	D. Barney		
Preparation date	4/15/09		
EPA COC Number:	0412-003		
Secondary filter pore size (um)	0.2		

Analyzed by:	E Wyatt-Pescador
Analysis date	6/20/13
Method (D=Direct, I=Indirect, IA=Indirect-ashed)	D
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	No
Analysis Method (TEM-ISO, TEM-AHERA, TEM-ASTM)	TEM-ISO
Grid storage location	2713-LIB-56
Archive filter(s) storage location	ESAT Archive
Lab QC Type (Not QC, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QC
Estimated Particulate Loading (%)	7

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right----->

Recording Rules:

Minimum Aspect Ratio (circle one):
none ≥ 3:1 ≥ 5:1

Minimum Length (um): 5.00

Minimum Width (um): 0.25 None

Stopping Rules:

Target Sensitivity: 0.0004

Max Area Examined: 10

Target # of Structures: 25

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Mineral Desc	EDXA	Sketch/ Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
G1	A1	NO																
	A2	NO																
	A3	NO																
	A4	NO																
	A5	NO																
	A6	NO																
	A7	NO																
	A8	NO																
	A9	NO																
	A10	NO																

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

CH = Chrysotile

NAM = Non-asbestos material

Are prepped grids acceptable for analysis? (circle one) Yes No
If No, explain:

Grid opening traverse direction (circle one):

H Horizontal
V Vertical

SUPPLEMENTAL AIR ANALYSIS:

Achieved sensitivity (cc⁻¹) from the original analysis

If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below.

Analyzed by:	
Analysis date:	
Instrument:	

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TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00012	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0004	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
G1	B1	ND																
	B2	ND																
	B3	ND																
	B4	ND																
	B5	ND																
	B6	ND																
	B7	ND																
	B8	ND																
	B9	ND																
	B10	ND																
	C1	ND																
	C2	ND																
	C3	ND																
	C4	ND																
	C5	ND																

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TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00012	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0004	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
G1	C6	ND																
	C7	ND																
	C8	ND																
	C9	ND																
	C10	ND																
	D1	ND																
	D2	ND																
	D3	ND																
	D4	ND																
	D5	ND																
	D6	ND																
	D7	ND																
	D8	ND																
	D9	ND																
	D10	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00012	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0004	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
G1	E1	ND																
	E2	ND																
	E3	ND																
	E4	ND																
	E5	ND																
	E6	ND																
	E7	ND																
	E8	ND																
	E9	ND																
	E10	ND																
G3	A1	ND																
	A2	ND																
	A3	ND																
	A4	ND																
	A5	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00012	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0004	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
63	A6	ND																
	A7	ND																
	A8	ND																
	A9	ND																
	A10	ND																
	B1	ND																
	B2	ND																
	B3	ND																
	B4	ND																
	B5	ND																
	B6	ND																
	B7	ND																
	B8	ND																
	B9	ND																
	B10	ND																

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TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00012	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0004	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
G3	C1	ND																
	C2	ND																
	C3	ND																
	C4	ND																
	C5	ND																
	C6	ND																
	C7	ND																
	C8	ND																
	C9	ND																
	C10	ND																
	D1	ND																
	D2	ND																
	D3	ND																
	D4	ND																
	D5	ND																

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TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00012	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0004	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
G3	D6	ND																
	D7	ND																
	D8	ND																
	D9	ND																
	D10	ND																
	E1	ND																
	E2	ND																
	E3	ND																
	E4	ND																
	E5	ND																
	E6	ND																
	E7	ND																
	E8	ND																
	E9	ND																
	E10	ND																

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TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00012	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0004	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
G3	F1	ND																
	F2	ND																
	F3	ND																
	F4	ND																
	F5	ND																
	F6	ND																
	F7	ND																
	F8	ND																
	F9	ND																
	F10	ND																
STOP 6/20/2013																		

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID:	EMSL27	
Instrument ID	JEOL 100 CX II (27-2)	
Voltage (KV)	100	
Mag.	4,800 X	HIGH LOW
Grid opening area (mm2)	0.013	
Scale: 1L =	1	
Scale: 1D =	1	
Primary filter area (mm2)	385	
Secondary Filter Area (mm2)	360	
Category (Field, Blank)	Field	
Primary filter pore size (um)	0.8	

EPA Sample Number:	BA-00021	Tag:	AL1
Matrix (A=Air, D=Dust, DF = Dustfall):	A		
Air volume (L), dust area (cm2), or dustfall container area (cm2)	988		
Date received by lab	5/21/2013		
Lab Job Number:	271300244		
Lab Sample Number:	271300244-0005		
Number of grids prepared	10		
Prepared by	D. Barney		
Preparation date	6/18/2013		
EPA COC Number:	0412-003		
Secondary filter pore size (um)	0.2		

Analyzed by:	E Wyatt-Pescador
Analysis date	6/20/2013
Method (D=Direct, I=Indirect, IA=Indirect-ashed)	D
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	No
Analysis Method (TEM-ISO, TEM-AHERA, TEM-ASTM)	TEM-ISO
Grid storage location	2713-LIB-56
Archive filter(s) storage location	ESAT Archive
Lab QC Type (Not QC, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QC
Estimated Particulate Loading (%)	5

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right----->

Recording Rules:

Minimum Aspect Ratio (circle one):
none ≥ 3:1 ≥ 5:1

Minimum Length (um): 5.0

Minimum Width (um): 0.25 None

Stopping Rules:

Target Sensitivity: 0.0004

Max Area Examined: 10

Target # of Structures: 25

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Mineral Desc	EDXA	Sketch/ Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
I1	A1	NO																
	A2	NO																
	A3	NO																
	A4	NO																
	A5	NO																
	A6	NO																
	A7	NO																
	A8	NO																
	A9	NO																
	A10	NO																

F-factor Calculation:

Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

CH = Chrysotile

NAM = Non-asbestos material

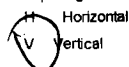
Are prepped grids acceptable for analysis? (circle one) Yes No
If No, explain:

136

If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below:

Analyzed by:	
Analysis date:	
Instrument:	

Grid opening traverse direction (circle one):



SUPPLEMENTAL AIR ANALYSIS:

	Achieved sensitivity (cc ⁻¹) from the original analysis
--	---

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00021	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0005	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
I1	C1	ND																
	C2	ND																
	C3	ND																
	C4	ND																
	C5	ND																
	C6	ND																
	C7	ND																
	C8	ND																
	C9	ND																
	C10	ND																
	D1	ND																
	D2	ND																
	D3	ND																
	D4	ND																
	D5	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00021	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0005	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
I1	D6	ND																
	D7	ND																
	D8	ND																
	D9	ND																
	D10	ND																
	F1	ND																
	F2	ND																
	F3	ND																
	F4	ND																
	F5	ND																
	F6	ND																
	F7	ND																
	F8	ND																
	F9	ND																
	F10	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00021	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0005	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
I3	B1	ND																
	B2	ND																
	B3	ND																
	B4	ND																
	B5	ND																
	B6	ND																
	B7	ND																
	B8	ND																
	B9	ND																
	B10	ND																
	D1	ND																
	D2	ND																
	D3	ND																
	D4	ND																
	D5	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID

EMSL27

EPA Sample Number

BA-00021

Lab QC Type

Not QC

Lab Job Number

271300244

Lab Sample Number

271300244-0005

Matrix

A

Analyst Name

E. Wyatt-Pescador

Grid Storage Loc.

2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
I3	D6	ND																
	D7	ND																
	D8	ND																
	D9	ND																
	D10	ND																
	F1	ND																
	F2	ND																
	F3	ND																
	F4	ND																
	F5	ND																
	F6	ND																
	F7	ND																
	F8	ND																
	F9	ND																
	F10	ND																

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TEM Asbestos Structure Count Air-DustEDD_38f

EMSL27

BA-00021

Not QC

271300244

271300244-0005

A

E. Wyatt-Pescador

2713-LIB-56

~~Σ Jmp 6/20/2013~~

LIBBY
TEM Asbestos Structure Count Air-Dust EDD_38f

Laboratory ID:	EMSL27
Instrument ID	JEOL 100 CX II (27-2)
Voltage (KV)	100
Mag.	4,800 X
	HIGH LOW
Grid opening area (mm2)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	360
Category (Field, Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00022	Tag:	AL1
Matrix (A=Air, D=Dust, DF = Dustfall):	A		
Air volume (L), dust area (cm2), or dustfall container area (cm2)	1016		
Date received by lab	5/21/2013		
Lab Job Number:	271300244		
Lab Sample Number:	271300244-0006		
Number of grids prepared	10		
Prepared by	D. Barney		
Preparation date	4/15/09 6/18/2013		
EPA COC Number:	0412-003		
Secondary filter pore size (um)	0.2		

Analyzed by:	E. Wyatt-Pescador
Analysis date	6/21/2013
Method (D=Direct, I=Indirect, IA=Indirect-ashed)	D
If sample type = air, is there loose material or debris in the bowl? (Yes, No)	No
Analysis Method (TEM-ISO, TEM-AHERA, TEM-ASTM)	TEM-ISO
Grid storage location	2713-LIB-56
Archive filter(s) storage location	ESAT Archive
Lab QC Type (Not QC, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QC
Estimated Particulate Loading (%)	5

F-Factor Calculation (Indirect Preps Only):
Enter data in appropriate cells provided to the right----->

Recording Rules:

Minimum Aspect Ratio (circle one):
none ≥ 3:1 ≥ 5:1

Minimum Length (um): 5.0

Minimum Width (um): 0.25

Stopping Rules:

Target Sensitivity: 0.0004

Max Area Examined: 10

Target # of Structures: 25

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Mineral Desc	EDXA	Sketch/ Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
K2	B2	ND																
	B4	ND																
	B6	ND																
	B8	ND																
	B10	ND																
	C1	ND																
	C3	ND																
	C5	ND																
	C7	ND																
	C9	ND																

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

LA = Libby-type amphibole OA = Other (non-Libby type) amphibole CH = Chrysotile NAM = Non-asbestos material

Are prepped grids acceptable for analysis? (circle one) Yes No
If No, explain:

142 If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below.

Grid opening traverse direction (circle one):
H Horizontal
D Vertical

Analyzed by:	EJP
Analysis date:	7/1/2013
Instrument:	27-2

SUPPLEMENTAL AIR ANALYSIS:

Achieved sensitivity (cc⁻¹) from the original analysis

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00022	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0006	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
K2	D2	ND																
	D4	ND																
	D6	ND																
	D8	ND																
	D10	ND																
	E1	ND																
	E3	ND																
	E5	ND																
	E7	ND																
	E9	ND																
	F2	ND																
	F4	ND																
	F6	ND																
	F8	ND																
	F10	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00022	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0006	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
K2	G1	ND																
	G3	ND																
	G5	ND																
	G7	ND																
	G9	ND																
	H2	ND																
	H4	ND																
	H6	ND																
	H8	ND																
	H10	ND																
K4	A1	ND																
	A3	ND																
	A5	ND																
	A7	ND																
	A9	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00022	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0006	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
K4	B2	ND																
	B4	ND																
	B6	ND																
	B8	ND																
	B10	ND																
	C1	ND																
	C3	ND																
	C5	ND																
	C7	ND																
	C9	ND																
	E2	ND																
	E4	ND																
	E6	ND																
	E8	ND																
	E10	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00022	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0006	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
K4	F1	ND																
	F3	ND																
	F5	ND																
	F7	ND																
	F9	ND																
	G2	ND																
	G4	ND																
	G6	ND																
	G8	ND																
	G10	ND																
	H1	ND																
	H3	ND																
	H5	ND																
	H7	ND																
	H9	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00022	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0006	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
K6	B4	MD																
	B6	MD																
	B8	MD																
Stop 7/1/2013																		

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID:	EMSL27	
Instrument ID	JEOL 100 CX II (27-2)	
Voltage (KV)	100	
Mag.	4,800 X	HIGH LOW
Grid opening area (mm2)	0.013	
Scale: 1L =	1	
Scale: 1D =	1	
Primary filter area (mm2)	385	
Secondary Filter Area (mm2)	360	
Category (Field, Blank)	Field	
Primary filter pore size (um)	0.8	

EPA Sample Number:	BA-00029	Tag:	AL1
Matrix (A=Air, D=Dust, DF = Dustfall):	A		
Air volume (L), dust area (cm2), or dustfall container area (cm2)	1145		
Date received by lab	5/21/2013		
Lab Job Number:	271300244		
Lab Sample Number:	271300244-0007		
Number of grids prepared	10		
Prepared by	D. Barney		
Preparation date	4/15/09		
EPA COC Number:	0412-003		
Secondary filter pore size (um)	0.2		

Analyzed by:	E Wyatt-Pescador
Analysis date	6/21/2013
Method (D=Direct, I=Indirect, IA=Indirect-ashed)	D
If sample type = air, is there loose material or debris in the bowl? (Yes, No)	No
Analysis Method (TEM-ISO, TEM-AHERA, TEM-ASTM)	TEM-ISO
Grid storage location	2713-LIB-56
Archive filter(s) storage location	ESAT Archive
Lab QC Type (Not QC, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QC
Estimated Particulate Loading (%)	6

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right----->

Recording Rules:

Minimum Aspect Ratio (circle one):
none ≥ 3:1 ≥ 5:1

Minimum Length (um): 500

Minimum Width (um): 0.25

Stopping Rules:

Target Sensitivity: 0.0004

Max Area Examined: 10

Target # of Structures: 25

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Mineral Desc	EDXA	Sketch/ Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
M2	A1	ND																
	A3	ND																
	A5	ND																
	A7	ND																
	A9	ND																
	B2	ND																
	B4	ND																
	B6	ND																
	B8	ND																
	B10	ND																

F-factor Calculation:

Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)
	First resuspension volume or rinse volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

CH = Chrysotile

NAM = Non-asbestos material

Are prepped grids acceptable for analysis? (circle one) Yes No
If No, explain:

148

If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below.

Analyzed by:	
Analysis date:	
Instrument:	

Grid opening traverse direction (circle one):

H Horizontal
V Vertical

SUPPLEMENTAL AIR ANALYSIS:

	Achieved sensitivity (cc ⁻¹) from the original analysis
--	---

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00029	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0007	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
M2	C1	ND																
	C3	ND																
	C5	ND																
	C7	ND																
	C9	ND																
	D2	ND																
	D4	ND																
	D6	ND																
	D8	ND																
	D10	ND																
	E1	ND																
	E3	ND																
	E5	ND																
	E7	ND																
	E9	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00029	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0007	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
M2	F2	ND																
	F4	ND																
	F6	ND																
	F8	ND																
	F10	ND																
M4	B2	ND																
	B4	ND																
	B6	ND																
	B8	ND																
	B10	ND																
	C1	ND																
	C3	ND																
	C5	ND																
	C7	ND																
	C9	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00029	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0007	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
M4	F2	NO																
	F4	NO																
	F6	NO																
	F8	NO																
	F10	NO																
	G1	NO																
	G3	NO																
	G5	NO																
	G7	NO																
	G9	NO																
	H2	NO																
	H4	NO																
	H6	NO																
	H8	NO																
	H10	NO																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00029	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0007	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
M4	I1	ND																
	I3	ND																
	I5	ND																
	I7	ND																
	I9	ND																
	J2	ND																
	J4	ND																
	J6	ND																
	J8	ND																
	J10	ND																
Stop 6/21/2013																		

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID:	EMSL27
Instrument ID	JEOL 100 CX II (27-2)
Voltage (KV)	100
Mag	4,800 X
Grid opening area (mm2)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	360
Category (Field, Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00030	Tag:	AL1
Matrix (A=Air, D=Dust, DF = Dustfall):	A		
Air volume (L), dust area (cm2), or dustfall container area (cm2)	1145		
Date received by lab	5/21/2013		
Lab Job Number:	271300244		
Lab Sample Number:	271300244-0008		
Number of grids prepared	10		
Prepared by	D. Barney		
Preparation date	4/15/09		
EPA COC Number:	0412-003		
Secondary filter pore size (um)	0.2		

Analyzed by:	E. Wyatt-Pescador
Analysis date	6/21/2013
Method (D=Direct, I=Indirect, IA=Indirect-ashed)	D
If sample type = air, is there loose material or debris in the bowl? (Yes, No)	No
Analysis Method (TEM-ISO, TEM-AHERA, TEM-ASTM)	TEM-ISO
Grid storage location	2713-LIB-56
Archive filter(s) storage location	ESAT Archive
Lab QC Type (Not QC, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QC
Estimated Particulate Loading (%)	3

Recording Rules:

Minimum Aspect Ratio (circle one):
none ≥ 3:1 ≥ 5:1

Minimum Length (um): 5.06

Minimum Width (um): 0.25

Stopping Rules:

Target Sensitivity: 0.0004

Max Area Examined: 10

Target # of Structures: 25

F-Factor Calculation (Indirect Preps Only):
Enter data in appropriate cells provided to the right----->

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Mineral Desc	EDXA	Sketch/ Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
02	A2	ND																
	A4	ND																
	A6	ND																
	A8	ND																
	A10	ND																
	B1	ND																
	B3	ND																
	B5	ND																
	B7	ND																
	B9	ND																

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

LA = Libby-type amphibole OA = Other (non-Libby type) amphibole CH = Chrysotile NAM = Non-asbestos material

Are prepped grids acceptable for analysis? (circle one) Yes No
If No, explain:

153 If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below.

Grid opening traverse direction (circle one):
H Horizontal
V Vertical

Analyzed by:	
Analysis date:	
Instrument:	

SUPPLEMENTAL AIR ANALYSIS:

Achieved sensitivity (cc⁻¹) from the original analysis

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00030	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0008	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
02	D2	ND																
	D4	ND																
	D6	ND																
	D8	ND																
	D10	ND																
	E1	ND																
	E3	ND																
	E5	ND																
	E7	ND																
	E9	ND																
	F2	ND																
	F4	ND																
	F6	ND																
	F8	ND																
	F10	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00030	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0008	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
02	G1	ND																
	G3	ND																
	G5	ND																
	G7	ND																
	G9	ND																
04	B1	ND																
	B3	ND																
	B5	ND																
	B7	ND																
	B9	ND																
	E2	ND																
	E4	ND																
	E6	ND																
	E8	ND																
	E10	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00030	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0008	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
04	F1	ND																
	F3	ND																
	F5	ND																
	F7	ND																
	F9	ND																
	G2	ND																
	G4	ND																
	G6	ND																
	G8	ND																
	G10	ND																
	H1	ND																
	H3	ND																
	H5	ND																
	H7	ND																
	H9	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00030	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0008	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
04	I2	ND																
	I4	ND																
	I6	ND																
	I8	ND																
	I10	ND																
	J1	ND																
	J3	ND																
	J5	ND																
	J7	ND																
	J9	ND																

2.5MP 6/21/2013

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID:	EMSL27	
Instrument ID	JEOL 100 CX II (27-2)	
Voltage (KV)	100	
Mag.	4,800 X	HIGH <u>LOW</u>
Grid opening area (mm2)	0.013	
Scale: 1L =	1	
Scale: 1D =	1	
Primary filter area (mm2)	385	
Secondary Filter Area (mm2)	360	
Category (Field, Blank)	Field	
Primary filter pore size (um)	0.8	

EPA Sample Number:	BA-00037	Tag:	AL1
Matrix (A=Air, D=Dust, DF = Dustfall):	A		
Air volume (L), dust area (cm2), or dustfall container area (cm2)	739		
Date received by lab	5/21/2013		
Lab Job Number:	271300244		
Lab Sample Number:	271300244-0009		
Number of grids prepared	10		
Prepared by	E. Wyatt-Pescador		
Preparation date	4/15/2009		
EPA COC Number:	0412-003		
Secondary filter pore size (um)	0.2		

Analyzed by:	E. Wyatt-Pescador
Analysis date	<u>6/25/2013</u>
Method (D=Direct, I=Indirect, IA=Indirect-ashed)	IA
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	No
Analysis Method (TEM-ISO, TEM-AHERA, TEM-ASTM)	TEM-ISO
Grid storage location	2713-LIB-56
Archive filter(s) storage location	ESAT Archive
Lab QC Type (Not QC, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QC
Estimated Particulate Loading (%)	<u>5</u>

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right----->

Recording Rules:

Minimum Aspect Ratio (circle one):
none ≥ 3:1 ≥ 5:1

Minimum Length (um): 5.05

Minimum Width (um): 0.25 none

Stopping Rules:

Target Sensitivity: 0.0004

Max Area Examined: 10

Target # of Structures: 25

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Mineral Desc	EDXA	Sketch/ Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
<u>Q2</u>	<u>A1</u>	<u>ND</u>																
	<u>A2</u>	<u>ND</u>																
	<u>A3</u>	<u>ND</u>																
	<u>A4</u>	<u>ND</u>																
	<u>A5</u>	<u>ND</u>																
	<u>A6</u>	<u>ND</u>																
	<u>A7</u>	<u>ND</u>																
	<u>A8</u>	<u>ND</u>																
	<u>A9</u>	<u>ND</u>																
	<u>A10</u>	<u>ND</u>																

F-factor Calculation:

Indirect Prep Inputs

.5 Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)

100 First resuspension volume or rinse volume (mL)

25 Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

CH = Chrysotile

NAM = Non-asbestos material

Are prepped grids acceptable for analysis? (circle one) Yes No
If No, explain:

158

If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below.

Analyzed by:	
Analysis date:	
Instrument:	

Grid opening traverse direction (circle one):

H Horizontal
V Vertical

SUPPLEMENTAL AIR ANALYSIS:

Achieved sensitivity (cc⁻¹) from the original analysis

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q2	B1	ND																
	B2	ND																
	B3	ND																
	B4	ND																
	B5	ND																
	B6	ND																
	B7	ND																
	B8	ND																
	B9	ND																
	B10	ND																
	C1	ND																
	C2	ND																
	C3	ND																
	C4	ND																
	C5	ND																

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TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q2	C6	ND																
	C7	ND																
	C8	ND																
	C9	ND																
	C10	ND																
	D1	ND																
	D2	ND																
	D3	ND																
	D4	ND																
	D5	ND																
	D6	ND																
	D7	ND																
	D8	ND																
	D9	ND																
	D10	ND																

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TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q2	E1	NO																
	E2	NO																
	E3	NO																
	E4	NO																
	E5	NO																
	E6	NO																
	E7	NO																
	E8	NO																
	E9	NO																
	E10	NO																
	F1	NO																
	F2	NO																
	F3	NO																
	F4	NO																
	F5	NO																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
R2	F6	ND																
	F7	ND																
	F8	ND																
	F9	ND																
	F10	ND																
	G1	ND																
	G2	ND																
	G3	ND																
	G4	ND																
	G5	ND																
	G6	ND																
	G7	ND																
	G8	ND																
	G9	ND																
	G10	ND																

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TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q2	H1	NO																
	H2	NO																
	H3	NO																
	H4	NO																
	H5	NO																
	H6	NO																
	H7	NO																
	H8	NO																
	H9	NO																
	H10	NO																
	I1	NO																
	I2	NO																
	I3	NO																
	I4	NO																
	I5	NO																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q2	I6	ND																
	I7	ND																
	I8	ND																
	I9	ND																
	I10	ND																
	J1	ND																
	J2	ND																
	J3	ND																
	J4	ND																
	J5	ND																
	J6	ND																
	J7	ND																
	J8	ND																
	J9	ND																
	J10	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q4	A1	ND																
	A2	ND																
	A3	ND																
	A4	ND																
	A5	ND																
	A6	ND																
	A7	ND																
	A8	ND																
	A9	ND																
	A10	ND																
	B1	ND																
	B2	ND																
	B3	ND																
	B4	ND																
	B5	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q4	B6	ND																
	B7	ND																
	B8	ND																
	B9	ND																
	B10	ND																
	C1	ND																
	C2	ND																
	C3	ND																
	C4	ND																
	C5	ND																
	C6	ND																
	C7	ND																
	C8	ND																
	C9	ND																
	C10	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EML27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q4	D1	ND																
	D2	ND																
	D3	ND																
	D4	ND																
	D5	ND																
	D6	ND																
	D7	ND																
	D8	ND																
	D9	ND																
	D10	ND																
	E1	ND																
	E2	ND																
	E3	ND																
	E4	ND																
	E5	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q4	E6	ND																
	E7	ND																
	E8	ND																
	E9	ND																
	E10	ND																
	F1	ND																
	F2	ND																
	F3	ND																
	F4	ND																
	F5	ND																
	F6	ND																
	F7	ND																
	F8	ND																
	F9	ND																
	F10	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
R4	G1	ND																
	G2	ND																
	G3	ND																
	G4	ND																
	G5	ND																
	G6	ND																
	G7	ND																
	G8	ND																
	G9	ND																
	G10	ND																
	H1	ND																
	H2	ND																
	H3	ND																
	H4	ND																
	H5	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q4	H6	NO																
	H7	NO																
	H8	NO																
	H9	NO																
	H10	NO																
	I1	NO																
	I2	NO																
	I3	NO																
	I4	NO																
	I5	NO																
	I6	NO																
	I7	NO																
	I8	NO																
	I9	NO																
	I10	NO																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q4	J1	ND																
	J2	ND																
	J3	ND																
	J4	ND																
	J5	ND																
	J6	ND																
	J7	ND																
	J8	ND																
	J9	ND																
	J10	ND																
Q6	A1	ND																
	A2	ND																
	A3	ND																
	A4	ND																
	A5	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q6	A6	ND																
	A7	ND																
	A8	ND																
	A9	ND																
	A10	ND																
	B1	ND																
	B2	ND																
	B3	ND																
	B4	ND																
	B5	ND																
	B6	ND																
	B7	ND																
	B8	ND																
	B9	ND																
	B10	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q6	C1	ND																
	C2	ND																
	C3	ND																
	C4	ND																
	C5	ND																
	C6	ND																
	C7	ND																
	C8	ND																
	C9	ND																
	C10	ND																
	D1	ND																
	D2	ND																
	D3	ND																
	D4	ND																
	D5	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
D6	D6	NO																
	D7	NO																
	D8	NO																
	D9	NO																
	D10	NO																
	E1	NO																
	E2	NO																
	E3	NO																
	E4	NO																
	E5	NO																
	E6	NO																
	E7	NO																
	E8	NO																
	E9	NO																
	E10	NO																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-000	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q6	F1	ND																
	F2	ND																
	F3	ND																
	F4	ND																
	F5	ND																
	F6	ND																
	F7	ND																
	F8	ND																
	F9	ND																
	F10	ND																
	G1	ND																
	G2	ND																
	G3	ND																
	G4	ND																
	G5	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q6	G6	NO																
	G7	NO																
	G8	NO																
	G9	NO																
	G10	NO																
	H1	NO																
	H2	NO																
	H3	NO																
	H4	NO																
	H5	NO																
	H6	NO																
	H7	NO																
	H8	NO																
	H9	NO																
	H10	NO																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q6	I1	ND																
	I2	ND																
	I3	ND																
	I4	ND																
	I5	ND																
	I6	ND																
	I7	ND																
	I8	ND																
	I9	ND																
	I10	ND																
	J1	ND																
	J2	ND																
	J3	ND																
	J4	ND																
	J5	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q6	J6	ND																
	J7	ND																
	J8	ND																
	J9	ND																
	J10	ND																
Q8	A1	ND																
	A2	ND																
	A3	ND																
	A4	ND																
	A5	ND																
	A6	ND																
	A7	ND																
	A8	ND																
	A9	ND																
	A10	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
QB	B1	MD																
	B2	MD																
	B3	MD																
	B4	MD																
	B5	MD																
	B6	MD																
	B7	MD																
	B8	MD																
	B9	MD																
	B10	MD																
	C1	MD																
	C2	MD																
	C3	MD																
	C4	MD																
	C5	MD																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q8	C6	ND																
	C7	ND																
	C8	ND																
	C9	ND																
	C10	ND																
	D1	ND																
	D2	ND																
	D3	ND																
	D4	ND																
	D5	ND																
	D6	ND																
	D7	ND																
	D8	ND																
	D9	ND																
	D10	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
QB	E1	NO																
	E2	NO																
	E3	NO																
	E4	NO																
	E5	NO																
	E6	NO																
	E7	NO																
	E8	NO																
	E9	NO																
	E10	NO																
	F1	NO																
	F2	NO																
	F3	NO																
	F4	NO																
	F5	NO																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q8	F6	ND																
	F7	ND																
	F8	ND																
	F9	ND																
	F10	ND																
	G1	ND																
	G2	ND																
	G3	ND																
	G4	ND																
	G5	ND																
	G6	ND																
	G7	ND																
	G8	ND																
	G9	ND																
	G10	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
QB	H1	ND																
	H2	ND																
	H3	ND																
	H4	ND																
	H5	ND																
	H6	ND																
	H7	ND																
	H8	ND																
	H9	ND																
	H10	ND																
	I1	ND																
	I2	ND																
	I3	ND																
	I4	ND																
	I5	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q8	I6	ND																
	I7	ND																
	I8	ND																
	I9	ND																
	I10	ND																
	J1	ND																
	J2	ND																
	J3	ND																
	J4	ND																
	J5	ND																
	J6	ND																
	J7	ND																
	J8	ND																
	J9	ND																
	J10	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q10	B1	ND																
	B2	ND																
	B3	ND																
	B4	ND																
	B5	ND																
	B6	ND																
	B7	ND																
	B8	ND																
	B9	ND																
	B10	ND																
	C1	ND																
	C2	ND																
	C3	ND																
	C4	ND																
	C5	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0003	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q10	C6	ND																
	C7	ND																
	C8	ND																
	C9	ND																
	C10	ND																
	D1	ND																
	D2	ND																
	D3	ND																
	D4	ND																
	D5	ND																
	D6	ND																
	D7	ND																
	D8	ND																
	D9	ND																
	D10	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q10	E1	ND																
	E2	ND																
	E3	ND																
	E4	ND																
	E5	ND																
	E6	ND																
	E7	ND																
	E8	ND																
	E9	ND																
	E10	ND																
	F1	ND																
	F2	ND																
	F3	ND																
	F4	ND																
	F5	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q10	F6	ND																
	F7	ND																
	F8	ND																
	F9	ND																
	F10	ND																
	G1	ND																
	G2	ND																
	G3	ND																
	G4	ND																
	G5	ND																
	G6	ND																
	G7	ND																
	G8	ND																
	G9	ND																
	G10	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q10	H1	NO																
	H2	NO																
	H3	NO																
	H4	NO																
	H5	NO																
	H6	NO																
	H7	NO																
	H8	NO																
	H9	NO																
	H10	NO																
	I1	NO																
	I2	NO																
	I3	NO																
	I4	NO																
	I5	NO																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
Q10	I6	NO																
	I7	NO																
	I8	NO																
	I9	NO																
	I10	NO																
	J1	NO																
	J2	NO																
	J3	NO																
	J4	NO																
	J5	NO																
	J6	NO																
	J7	NO																
	J8	NO																
	J9	NO																
	J10	NO																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
R1	A1	ND																
	A2	ND																
	A3	ND																
	A4	ND																
	A5	ND																
	A6	ND																
	A7	ND																
	A8	ND																
	A9	ND																
	A10	ND																
	B1	ND																
	B2	ND																
	B3	ND																
	B4	ND																
	B5	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
R1	B6	ND																
	B7	ND																
	B8	ND																
	B9	ND																
	B10	ND																
	C1	ND																
	C2	ND																
	C3	ND																
	C4	ND																
	C5	ND																
	C6	ND																
	C7	ND																
	C8	ND																
	C9	ND																
	C10	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
R1	D1	ND																
	D2	ND																
	D3	ND																
	D4	ND																
	D5	ND																
	D6	ND																
	D7	ND																
	D8	ND																
	D9	ND																
	D10	ND																
	E1	ND																
	E2	ND																
	E3	ND																
	E4	ND																
	E5	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
R1	E6	ND																
	E7	ND																
	E8	ND																
	E9	ND																
	E10	ND																
	F1	ND																
	F2	ND																
	F3	ND																
	F4	ND																
	F5	ND																
	F6	ND																
	F7	ND																
	F8	ND																
	F9	ND																
	F10	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
R1	G1	ND																
	G2	ND																
	G3	ND																
	G4	ND																
	G5	ND																
	G6	ND																
	G7	ND																
	G8	ND																
	G9	ND																
	G10	ND																
	H1	ND																
	H2	ND																
	H3	ND																
	H4	ND																
	H5	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
R1	A6	ND																
	H7	ND																
	H8	ND																
	H9	ND																
	H10	ND																
	I1	ND																
	I2	ND																
	I3	ND																
	I4	ND																
	I5	ND																
	I6	ND																
	I7	ND																
	I8	ND																
	I9	ND																
	I10	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
R3	A1	ND																
	A2	ND																
	A3	ND																
	A4	ND																
	A5	ND																
	A6	ND																
	A7	ND																
	A8	ND																
	A9	ND																
	A10	ND																
	B1	ND																
	B2	ND																
	B3	ND																
	B4	ND																
	B5	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0003	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
R3	B6	ND																
	B7	ND																
	B8	ND																
	B9	ND																
	B10	ND																
	C1	ND																
	C2	ND																
	C3	ND																
	C4	ND																
	C5	ND																
	C6	ND																
	C7	ND																
	C8	ND																
	C9	ND																
	C10	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
R3	D1	ND																
	D2	ND																
	D3	ND																
	D4	ND																
	D5	ND																
	D6	ND																
	D7	ND																
	D8	ND																
	D9	ND																
	D10	ND																
	E1	ND																
	E2	ND																
	E3	ND																
	E4	ND																
	E5	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
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R3	E6	ND																
	E7	ND																
	E8	ND																
	E9	ND																
	E10	ND																
	F1	ND																
	F2	ND																
	F3	ND																
	F4	ND																
	F5	ND																
	F6	ND																
	F7	ND																
	F8	ND																
	F9	ND																
	F10	ND																

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TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

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R3	G1	ND																
	G2	ND																
	G3	ND																
	G4	ND																
	G5	ND																
	G6	ND																
	G7	ND																
	G8	ND																
	G9	ND																
	G10	ND																
	H1	ND																
	H2	ND																
	H3	ND																
	H4	ND																
	H5	ND																

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TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

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			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
R3	H6	NO																
	H7	NO																
	H8	NO																
	H9	NO																
	H10	NO																
	I1	NO																
	I2	NO																
	I3	NO																
	I4	NO																
	I5	NO																
	I6	NO																
	I7	NO																
	I8	NO																
	I9	NO																
	I10	NO																

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Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
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			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
R3	J1	NO																
	J2	NO																
	J3	NO																
	J4	NO																
	J5	NO																
	J6	NO																
	J7	NO																
	J8	NO																
	J9	NO																
	J10	NO																
R5	A1	NO																
	A2	NO																
	A3	NO																
	A4	NO																
	A5	NO																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

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	A8	ND																
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	B3	ND																
	B4	ND																
	B5	ND																
	B6	ND																
	B7	ND																
	B8	ND																
	B9	ND																
	B10	ND																

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TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
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	C2	ND																
	C3	ND																
	C4	ND																
	C5	ND																
	C6	ND																
	C7	ND																
	C8	ND																
	C9	ND																
	C10	ND																
	D1	ND																
	D2	ND																
	D3	ND																
	D4	ND																
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	D7	ND																
	D8	ND																
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	E3	ND																
	E4	ND																
	E5	ND																
	E6	ND																
	E7	ND																
	E8	ND																
	E9	ND																
	E10	ND																

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Laboratory ID	EMSL27	EPA Sample Number	BA-00037	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

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			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
R5	F1	MD																
	F2	MD																
	F3	MD																
	F4	MD																
	F5	MD																
	F6	MD																
	F7	MD																
	F8	MD																
	F9	MD																
	F10	MD																
	G1	MD																
	G2	MD																
	G3	MD																
	G4	MD																
	G5	MD																

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TEM Asbestos Structure Count_Air-DustEDD_38f

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Lab Sample Number	271300244-0009	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

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	G7	NO																
	G8	NO																
	G9	NO																
	G10	NO																
	H1	NO																
	H2	NO																
	H3	NO																
	H4	NO																
	H5	NO																
	H6	NO																
	H7	NO																
	H8	NO																
	H9	NO																
	H10	NO																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID:	EMSL27	
Instrument ID	JEOL 100 CX II (27-2)	
Voltage (KV)	100	
Mag.	4,800 X	HIGH <u>LOW</u>
Grid opening area (mm2)	0.013	
Scale: 1L =	1	
Scale: 1D =	1	
Primary filter area (mm2)	385	
Secondary Filter Area (mm2)	360	
Category (Field, Blank)	Field	
Primary filter pore size (um)	0.8	

EPA Sample Number:	BA-00038	Tag:	AL1
Matrix (A=Air, D=Dust, DF = Dustfall):	A		
Air volume (L), dust area (cm2), or dustfall container area (cm2)	890		
Date received by lab	5/21/2013		
Lab Job Number:	271300244		
Lab Sample Number:	271300244-0010		
Number of grids prepared	10		
Prepared by	E. Wyatt-Pescador		
Preparation date	4/15/2009		
EPA COC Number:	0412-003		
Secondary filter pore size (um)	0.2		

Analyzed by:	E. Wyatt-Pescador
Analysis date	6/24/2013
Method (D=Direct, I=Indirect, IA=Indirect-ashed)	IA
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	No
Analysis Method (TEM-ISO, TEM-AHERA, TEM-ASTM)	TEM-ISO
Grid storage location	2713-LIB-56
Archive filter(s) storage location	ESAT Archive
Lab QC Type (Not QC, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QC
Estimated Particulate Loading (%)	6

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right----->

Recording Rules:

Minimum Aspect Ratio (circle one):
none ≥ 3:1 ≥ 5:1

Minimum Length (um): 5.0

Minimum Width (um): 0.25 ~~none~~

ms 7/11/13

Stopping Rules:

Target Sensitivity: 0.0004

Max Area Examined: 10

Target # of Structures: 25

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Mineral Desc	EDXA	Sketch/ Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
52	A1	ND																
	A2	ND																
	A3	ND																
	A4	ND																
	A5	ND																
	A6	ND																
	A7	ND																
	A8	ND																
	A9	ND																
	A10	ND																

F-factor Calculation:

Indirect Prep Inputs

<u>.5</u>	Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)
<u>100</u>	First resuspension volume or rinsate volume (mL)
<u>50</u>	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

CH = Chrysotile

NAM = Non-asbestos material

Are prepped grids acceptable for analysis? (circle one) Yes No
If No, explain:

209

If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below.

Analyzed by:	
Analysis date:	
Instrument:	

Grid opening traverse direction (circle one):

H Horizontal
V Vertical

SUPPLEMENTAL AIR ANALYSIS:

	Achieved sensitivity (cc ⁻¹) from the original analysis
--	---

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00038	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0010	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
S2	B1	ND																
	B2	ND																
	B3	ND																
	B4	ND																
	B5	ND																
	B6	ND																
	B7	ND																
	B8	ND																
	B9	ND																
	B10	ND																
	C1	ND																
	C2	ND																
	C3	ND																
	C4	ND																
	C5	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00038	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0010	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
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S2	C6	ND																
	C7	ND																
	C8	ND																
	C9	ND																
	C10	ND																
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	D3	ND																
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Lab Sample Number	271300244-0010	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

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S2	E1	NO																
	E2	NO																
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	E8	NO																
	E9	NO																
	E10	NO																
	F1	NO																
	F2	NO																
	F3	NO																
	F4	NO																
	F5	NO																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00038	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0010	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

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	F7	ND																
	F8	ND																
	F9	ND																
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	G3	ND																
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Lab Sample Number	271300244-0010	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

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	H2	ND																
	H3	ND																
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Lab Sample Number	271300244-0010	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

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	E7	NO																
	E8	NO																
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TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00038	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0010	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
54	G1	ND																
	G2	ND																
	G3	ND																
	G4	ND																
	G5	ND																
	G6	ND																
	G7	ND																
	G8	ND																
	G9	ND																
	G10	ND																
	H1	ND																
	H2	ND																
	H3	ND																
	H4	ND																
	H5	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00038	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0010	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
S4	H6	ND																
	H7	ND																
	H8	ND																
	H9	ND																
	H10	ND																
	I1	ND																
	I2	ND																
	I3	ND																
	I4	ND																
	I5	ND																
	I6	ND																
	I7	ND																
	I8	ND																
	I9	ND																
	I10	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00038	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0010	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
S4	J1	ND																
	J2	ND																
	J3	ND																
	J4	ND																
	J5	ND																
	J6	ND																
	J7	ND																
	J8	ND																
	J9	ND																
	J10	ND																
SG6	A1	ND																
	A2	ND																
	A3	ND																
	A4	ND																
	A5	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00038	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0010	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
S6	A6	NO																
	A7	NO																
	A8	NO																
	A9	NO																
	A10	NO																
	B1	NO																
	B2	NO																
	B3	NO																
	B4	NO																
	B5	NO																
	B6	NO																
	B7	NO																
	B8	NO																
	B9	NO																
	B10	NO																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00038	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0010	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
56	C1	ND																
	C2	ND																
	C3	ND																
	C4	ND																
	C5	ND																
	C6	ND																
	C7	ND																
	C8	ND																
	C9	ND																
	C10	ND																
	D1	ND																
	D2	ND																
	D3	ND																
	D4	ND																
	D5	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00038	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0010	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
SC6	D6	ND																
	D7	ND																
	D8	ND																
	D9	ND																
	D10	ND																
	E1	ND																
	E2	ND																
	E3	ND																
	E4	ND																
	E5	ND																
	E6	ND																
	E7	ND																
	E8	ND																
	E9	ND																
	E10	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00038	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0010	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
S6	F1	ND																
	F2	ND																
	F3	ND																
	F4	ND																
	F5	ND																
	F6	ND																
	F7	ND																
	F8	ND																
	F9	ND																
	F10	ND																
	G1	ND																
	G2	ND																
	G3	ND																
	G4	ND																
	G5	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00038	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0010	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
56	G6	ND																
	G7	ND																
	G8	ND																
	G9	ND																
	G10	ND																
	H1	ND																
	H2	ND																
	H3	ND																
	H4	ND																
	H5	ND																
	H6	ND																
	H7	ND																
	H8	ND																
	H9	ND																
	H10	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00038	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0010	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
S6	I1	NO																
	I2	NO																
	I3	NO																
	I4	NO																
	I5	NO																
	I6	NO																
	I7	NO																
	I8	NO																
	I9	NO																
	I10	NO																
	J1	NO																
	J2	NO																
	J3	NO																
	J4	NO																
	J5	NO																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00038	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0010	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
56	J6	ND																
	J7	ND																
	J8	ND																
	J9	ND																
	J10	ND																
58	A1	ND																
	A2	ND																
	A3	ND																
	A4	ND																
	A5	ND																
	A6	ND																
	A7	ND																
	A8	ND																
	A9	ND																
	A10	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00038	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0010	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
S8	B1	ND																
	B2	ND																
	B3	ND																
	B4	ND																
	B5	ND																
	B6	ND																
	B7	ND																
	B8	ND																
	B9	ND																
	B10	ND																
STOP 6/25/2013																		

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID:	EMSL27	
Instrument ID	JEOL 100 CX II (27-2)	
Voltage (KV)	100	
Mag.	4,800 X	HIGH LOW
Grid opening area (mm2)	0.013	
Scale: 1L =	1	
Scale: 1D =	1	
Primary filter area (mm2)	385	
Secondary Filter Area (mm2)	360	
Category (Field, Blank)	Field	
Primary filter pore size (um)	0.8	

EPA Sample Number:	BA-00047	Tag:	AL1
Matrix (A=Air, D=Dust, DF = Dustfall):	A		
Air volume (L), dust area (cm2), or dustfall container area (cm2)	1154		
Date received by lab	5/21/2013		
Lab Job Number:	271300244		
Lab Sample Number:	271300244-0011		
Number of grids prepared	10		
Prepared by	D. Barney		
Preparation date	4/15/09		
EPA COC Number:	0412-003		
Secondary filter pore size (um)	0.2		

Analyzed by:	E. Wyatt-Pescador
Analysis date	6/24/2013
Method (D=Direct, I=Indirect, IA=Indirect-ashed)	D
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	No
Analysis Method (TEM-ISO, TEM-AHERA, TEM-ASTM)	TEM-ISO
Grid storage location	2713-LIB-57
Archive filter(s) storage location	ESAT Archive
Lab QC Type (Not QC, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QC
Estimated Particulate Loading (%)	5

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right----->

<u>Recording Rules:</u>	
Minimum Aspect Ratio (circle one):	none <u>≥ 3:1</u> ≥ 5:1
Minimum Length (um):	<u>5</u>
Minimum Width (um):	<u>0.25</u>

<u>Stopping Rules:</u>	
Target Sensitivity:	0.0004
Max Area Examined:	10
Target # of Structures:	25

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Mineral Desc	EDXA	Sketch/ Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A1	A2	ND																
	A4	ND																
	A6	ND																
	A8	ND																
	A10	ND																
	B1	ND																
	B3	ND																
	B5	ND																
	B7	ND																
	B9	ND																

F-factor Calculation:

Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

CH = Chrysotile

NAM = Non-asbestos material

Are prepped grids acceptable for analysis? (circle one) Yes No
If No, explain:

If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below.

Analyzed by:	ESAP
Analysis date:	7/1/13
Instrument:	27-2

Grid opening traverse direction (circle one):

<u>H</u>	Horizontal
V	Vertical

SUPPLEMENTAL AIR ANALYSIS:

	Achieved sensitivity (cc ⁻¹) from the original analysis
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LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00047	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0011	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-57

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A1	C2	ND																
	C4	ND																
	C6	ND																
	C8	ND																
	C10	ND																
	D1	ND																
	D3	ND																
	D5	ND																
	D7	ND																
	D9	ND																
	E2	ND																
	E4	ND																
	E6	ND																
	E8	ND																
	E10	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID EMSL27
Lab Sample Number 271300244-0011

EPA Sample Number BA-00047
Matrix A

Lab QC Type Not QC
Analyst Name E. Wyatt-Pescador

Lab Job Number 271300244
Grid Storage Loc. 2713-LIB-57

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A1	F1	ND																
	F3	ND																
	F5	ND																
	F7	ND																
	F9	ND																
A3	D1	ND																
	D3	ND																
	D5	ND																
	D7	ND																
	D9	ND																
	E2	ND																
	E4	ND																
	E6	ND																
	E8	ND																
	E10	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00047	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0011	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-57

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A3	F1	ND																
	F3	ND																
	F5	ND																
	F7	ND																
	F9	ND																
	G2	ND																
	G4	ND																
	G6	ND																
	G8	ND																
	G10	ND																
	H1	ND																
	H3	ND																
	H5	ND																
	H7	ND																
	H9	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00047	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0011	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-57

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A3	I2	MD																
	I4	MD																
	I6	MD																
	I8	MD																
	I10	MD																
A5	D2	MD																
	D4	MD																
	D6	MD																
	D8	MD																
	D10	MD																
STOP 7/11/2013																		

LIBBY
TEM Asbestos Structure Count Air-Dust EDD_38f

Laboratory ID:	EMSL27	
Instrument ID	JEOL 100 CX II (27-2)	
Voltage (KV)	100	
Mag.	4,800 X	HIGH LOW
Grid opening area (mm2)	0.013	
Scale: 1L =	1	
Scale: 1D =	1	
Primary filter area (mm2)	385	
Secondary Filter Area (mm2)	360	
Category (Field, Blank)	Field	
Primary filter pore size (um)	0.8	

EPA Sample Number:	BA-00048	Tag:	AL1
Matrix (A=Air, D=Dust, DF = Dustfall):	A		
Air volume (L), dust area (cm2), or dustfall container area (cm2)	1165		
Date received by lab	5/21/2013		
Lab Job Number:	271300244		
Lab Sample Number:	271300244-0012		
Number of grids prepared	10		
Prepared by	D. Barney		
Preparation date	4/15/09		
EPA COC Number:	0412-003		
Secondary filter pore size (um)	0.2		

Analyzed by:	E. Wyatt-Pescador
Analysis date	6/24/2013
Method (D=Direct, I=Indirect, IA=Indirect-ashed)	D
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	No
Analysis Method (TEM-ISO, TEM-AHERA, TEM-ASTM)	TEM-ISO
Grid storage location	2713-LIB-57
Archive filter(s) storage location	ESAT Archive
Lab QC Type (Not QC, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QC
Estimated Particulate Loading (%)	6

F-Factor Calculation (Indirect Preps Only):
Enter data in appropriate cells provided to the right----->

Recording Rules:

Minimum Aspect Ratio (circle one):
none ≥ 3:1 ≥ 5:1

Minimum Length (um): 500

Minimum Width (um): 0.25

Stopping Rules:

Target Sensitivity: 0.0004

Max Area Examined: 10

Target # of Structures: 25

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Mineral Desc	EDXA	Sketch/ Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
C1	A2	NO																
	A4	NO																
	A6	NO																
	A8	NO																
	A10	NO																
	B1	NO																
	B3	NO																
	B5	NO																
	B7	NO																
	B9	NO																

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

LA = Libby-type amphibole OA = Other (non-Libby type) amphibole CH = Chrysotile NAM = Non-asbestos material

Are prepped grids acceptable for analysis? (circle one) Yes No
If No, explain:

236 If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below.

Analyzed by:	LMP
Analysis date:	7/1/10/13
Instrument:	27-2

Grid opening traverse direction (circle one):
H Horizontal
V Vertical

SUPPLEMENTAL AIR ANALYSIS:

Achieved sensitivity (cc⁻¹) from the original analysis

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00048	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0012	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-57

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
C1	D2	ND																
	D4	ND																
	D6	ND																
	D8	ND																
	D10	ND																
	E1	ND																
	E3	ND																
	E5	ND																
	E7	ND																
	E9	ND																
	F2	ND																
	F4	ND																
	F6	ND																
	F8	ND																
	F10	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00048	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0012	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-57

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
C1	G1	ND																
	G3	ND																
	G5	ND																
	G7	ND																
	G9	ND																
C3	C1	ND																
	C3	ND																
	C5	ND																
	C7	ND																
	C9	ND																
	D2	ND																
	D4	ND																
	D6	ND																
	D8	ND																
	D10	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00048	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0012	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-57

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
C3	F1	ND																
	F3	ND																
	F5	ND																
	F7	ND																
	F9	ND																
	G2	ND																
	G4	ND																
	G6	ND																
	G8	ND																
	G10	ND																
	H1	ND																
	H3	ND																
	H5	ND																
	H7	ND																
	H9	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00048	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0012	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-57

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
C3	J2	ND																
	J4	ND																
	J6	ND																
	JB	ND																
	J10	ND																
C5	G2	ND																
	G4	ND																
	G6	ND																
	G8	ND																
	G10	ND																
STOP 7/1/2013																		

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID:	EMSL27	
Instrument ID	JEOL 100 CX II (27-2)	
Voltage (KV)	100	
Mag.	4,800 X	HIGH <u>LOW</u>
Grid opening area (mm ²)	0.813	
Scale: 1L =	1	
Scale: 1D =	1	
Primary filter area (mm ²)	385	
Secondary Filter Area (mm ²)	360	
Category (Field, Blank)	Field	
Primary filter pore size (um)	0.8	

EPA Sample Number:	BA-00058	Tag:	AL1
Matrix (A=Air, D=Dust, DF = Dustfall):	A		
Air volume (L), dust area (cm ²), or dustfall container area (cm ²)	510		
Date received by lab	5/21/2013		
Lab Job Number:	271300244		
Lab Sample Number:	271300244-0013		
Number of grids prepared	10		
Prepared by	D. Barney		
Preparation date	<u>4/15/04</u>		
EPA COC Number:	0412-003		
Secondary filter pore size (um)	0.2		

Analyzed by:	E. Wyatt-Pescador
Analysis date	<u>6/24/2013</u>
Method (D=Direct, I=Indirect, IA=Indirect-ashed)	D
If sample type = air, is there loose material or debris in the cow? (Yes, No)	No
Analysis Method (TEM-ISO, TEM-AHERA, TEM-ASTM)	TEM-ISO
Grid storage location	2713-LIB-57
Archive filter(s) storage location	ESAT Archive
Lab QC Type (Not QC, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QC
Estimated Particulate Loading (%)	<u>3</u>

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right----->

Recording Rules:

Minimum Aspect Ratio (circle one):
none ≥ 3:1 ≥ 5:1

Minimum Length (um): 5

Minimum Width (um): 0.25

Stopping Rules:

Target Sensitivity: 0.0004

Max Area Examined: 10

Target # of Structures: 25

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Mineral Desc	EDXA	Sketch/ Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
E1	A1	NO																
	A2	NO																
	A3	NO																
	A4	NO																
	A5	NO																
	A6	NO																
	A7	NO																
	A8	NO																
	A9	NO																
	A10	NO																

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)

First resuspension volume or rinse volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

CH = Chrysotile

NAM = Non-asbestos material

Are prepped grids acceptable for analysis? (circle one) Yes No
If No, explain:

If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below.

Analyzed by:	<u>ESUP</u>
Analysis date:	<u>7/11/13</u>
Instrument:	<u>27-2</u>

Grid opening traverse direction (circle one):

H Horizontal
V Vertical

SUPPLEMENTAL AIR ANALYSIS:

Achieved sensitivity (cc⁻¹) from the original analysis

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00058	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0013	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-57

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
E1	B1	ND																
	B2	ND																
	B3	ND																
	B4	ND																
	B5	ND																
	B6	ND																
	B7	ND																
	B8	ND																
	B9	ND																
	B10	ND																
	C1	ND																
	C2	ND																
	C3	ND																
	C4	ND																
	C5	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00058	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0013	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-57

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
E1	C6	ND																
	C7	ND																
	C8	ND																
	C9	ND																
	C10	ND																
	D1	ND																
	D2	ND																
	D3	ND																
	D4	ND																
	D5	ND																
	D6	ND																
	D7	ND																
	D8	ND																
	D9	ND																
	D10	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00058	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0013	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-57

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
E1	E1	MD																
	E2	MD																
	E3	MD																
	E4	MD																
	E5	MD																
	E6	MD																
	E7	MD																
	E8	MD																
	E9	MD																
	E10	MD																
	F1	MD																
	F2	MD																
	F3	MD																
	F4	MD																
	F5	MD																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00058	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0013	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-57

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
E1	F6	ND																
	F7	ND																
	F8	ND																
	F9	ND																
	F10	ND																
	G1	ND																
	G2	ND																
	G3	ND																
	G4	ND																
	G5	ND																
	G6	ND																
	G7	ND																
	G8	ND																
	G9	ND																
	G10	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00058	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0013	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-57

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
E3	A1	ND																
	A2	ND																
	A3	ND																
	A4	ND																
	A5	ND																
	A6	ND																
	A7	ND																
	A8	ND																
	A9	ND																
	A10	ND																
	B1	ND																
	B2	ND																
	B3	ND																
	B4	ND																
	B5	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00058	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0013	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-57

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
E3	B6	ND																
	B7	ND																
	B8	ND																
	B9	ND																
	B10	ND																
	C1	ND																
	C2	ND																
	C3	ND																
	C4	ND																
	C5	ND																
	C6	ND																
	C7	ND																
	C8	ND																
	C9	ND																
	C10	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00058	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0013	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-57

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
E3	D1	MD																
	D2	MD																
	D3	MD																
	D4	MD																
	D5	MD																
	D6	MD																
	D7	MD																
	D8	MD																
	D9	MD																
	D10	MD																
	E1	MD																
	E2	MD																
	E3	MD																
	E4	MD																
	E5	MD																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00058	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0013	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-57

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
E3	E6	ND																
	E7	ND																
	E8	ND																
	E9	ND																
	E10	ND																
	F1	ND																
	F2	ND																
	F3	ND																
	F4	ND																
	F5	ND																
	F6	ND																
	F7	ND																
	F8	ND																
	F9	ND																
	F10	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00058	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0013	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-57

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
E3	G1	ND																
	G2	ND																
	G3	ND																
	G4	ND																
	G5	ND																
	G6	ND																
	G7	ND																
	G8	ND																
	G9	ND																
	G10	ND																
ETMP 6/24/2013																		

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID

EMSL27

EPA Sample Number

BA-00058

Lab QC Type

Not QC

Lab Job Number

271300244

Lab Sample Number

271300244-0013

Matrix

A

Analyst Name

E. Wyatt-Pescador

☐ Grid Storage Loc. ☐

2713-LIB-57

[illegible]

LIBBY
TEM Asbestos Structure Count Air-Dust EDD_38f

Laboratory ID:	EMSL27
Instrument ID	JEOL 100 CX II (27-2)
Voltage (KV)	100
Mag.	4,800 X
Grid opening area (mm ²)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	360
Category (Field, Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00059	Tag:	AL1
Matrix (A=Air, D=Dust, DF = Dustfall):	A		
Air volume (L), dust area (cm ²), or dustfall container area (cm ²)	501		
Date received by lab	5/21/2013		
Lab Job Number:	271300244		
Lab Sample Number:	271300244-0014		
Number of grids prepared	10		
Prepared by	D. Barney		
Preparation date	4/12/13		
EPA COC Number:	0412-003		
Secondary filter pore size (um)	0.2		

Analyzed by:	E. Wyatt-Pescador
Analysis date	6/24/2013
Method (D=Direct, I=Indirect, IA=Indirect-ashed)	D
If sample type = air, is there loose material or debris in the bowl? (Yes, No)	No
Analysis Method (TEM-ISO, TEM-AHERA, TEM-ASTM)	TEM-ISO
Grid storage location	2713-LIB-57
Archive filter(s) storage location	ESAT Archive
Lab QC Type (Not QC, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QC
Estimated Particulate Loading (%)	2

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right----->

Recording Rules:	
Minimum Aspect Ratio (circle one):	none <u>≥ 3:1</u> ≥ 5:1
Minimum Length (um):	<u>5-6</u>
Minimum Width (um):	<u>0.25</u> none

Stopping Rules:	
Target Sensitivity:	0.0004
Max Area Examined:	10
Target # of Structures:	25

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Mineral Desc	EDXA	Sketch/ Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
G1	B1	ND																
	B2	ND																
	B3	ND																
	B4	ND																
	B5	ND																
	B6	ND																
	B7	ND																
	B8	ND																
	B9	ND																
	B10	ND																

F-factor Calculation:

Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)
	First resuspension volume or rinse volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

CH = Chrysotile

NAM = Non-asbestos material

Are prepped grids acceptable for analysis? (circle one) Yes No
If No, explain:

252

If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below.

Analyzed by:	95MP
Analysis date:	7/11/13
Instrument:	27-2

Grid opening traverse direction (circle one):

H Horizontal
V Vertical

SUPPLEMENTAL AIR ANALYSIS:

	Achieved sensitivity (cc ⁻¹) from the original analysis
--	---

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00059	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0014	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-57

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
G1	C1	ND																
	C2	ND																
	C3	ND																
	C4	ND																
	C5	ND																
	C6	ND																
	C7	ND																
	C8	ND																
	C9	ND																
	C10	ND																
	D1	ND																
	D2	ND																
	D3	ND																
	D4	ND																
	D5	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00059	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0014	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-57

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
G1	D6	ND																
	D7	ND																
	D8	ND																
	D9	ND																
	D10	ND																
	E1	ND																
	E2	ND																
	E3	ND																
	E4	ND																
	E5	ND																
	E6	ND																
	E7	ND																
	E8	ND																
	E9	ND																
	E10	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00059	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0014	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-57

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
G1	F1	ND																
	F2	ND																
	F3	ND																
	F4	ND																
	F5	ND																
	F6	ND																
	F7	ND																
	F8	ND																
	F9	ND																
	F10	ND																
	G1	ND																
	G2	ND																
	G3	ND																
	G4	ND																
	G5	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00059	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0014	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-57

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
G1	G6	NO																
	G7	NO																
	G8	NO																
	G9	NO																
	G10	NO																
	H1	NO																
	H2	NO																
	H3	NO																
	H4	NO																
	H5	NO																
	H6	NO																
	H7	NO																
	H8	NO																
	H9	NO																
	H10	NO																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00059	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0014	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-57

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
G3	C1	ND																
	C2	ND																
	C3	ND																
	C4	ND																
	C5	ND																
	C6	ND																
	C7	ND																
	C8	ND																
	C9	ND																
	C10	ND																
	D1	ND																
	D2	ND																
	D3	ND																
	D4	ND																
	D5	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00059	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0014	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-57

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
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	D7	ND																
	D8	ND																
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	E2	ND																
	E3	ND																
	E4	ND																
	E5	ND																
	E6	ND																
	E7	ND																
	E8	ND																
	E9	ND																
	E10	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00059	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0014	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-57

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
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	F2	ND																
	F3	ND																
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	F5	ND																
	F6	ND																
	F7	ND																
	F8	ND																
	F9	ND																
	F10	ND																
	G1	ND																
	G2	ND																
	G3	ND																
	G4	ND																
	G5	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00059	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0014	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-57

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
G3	G6	ND																
	G7	ND																
	G8	ND																
	G9	ND																
	G10	ND																
	H1	ND																
	H2	ND																
	H3	ND																
	H4	ND																
	H5	ND																
	H6	ND																
	H7	ND																
	H8	ND																
	H9	ND																
	H10	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00059	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0014	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-57

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
G3	I1	ND																
	I2	ND																
	I3	ND																
	I4	ND																
	I5	ND																
	I6	ND																
	I7	ND																
	I8	ND																
	I9	ND																
	I10	ND																
EDP 6/24/2013																		

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00059	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0014	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-57

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
G5	A1	MD																
	A3	MD																
	A5	MD																
	A7	MD																
	A9	MD																
	B2	MD																
	B4	MD																
	B6	MD																
<div>Stop 7/1/2013</div>																		

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID:	EMSL27
Instrument ID	JEOL 100 CX II (27-2)
Voltage (KV)	100
Mag.	4,800 X
Grid opening area (mm ²)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	360
Category (Field, Blank)	Blank
Primary filter pore size (um)	0.8

EPA Sample Number:	LQ-00001	Tag:	AL1
Matrix (A=Air, D=Dust, DF = Dustfall):	A		
Air volume (L), dust area (cm ²), or dustfall container area (cm ²)	0		
Date received by lab	7/18/13		
Lab Job Number:	271300244		
Lab Sample Number:	271300244		
Number of grids prepared	3		
Prepared by	D. Barney		
Preparation date	7/15/09		
EPA COC Number:	0412-003		
Secondary filter pore size (um)	0.2		

Analyzed by:	E. Wyatt-Pescador
Analysis date	6/26/2013
Method (D=Direct, I=Indirect, IA=Indirect-ashed)	D
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	No
Analysis Method (TEM-ISO, TEM-AHERA, TEM-ASTM)	TEM-ISO
Grid storage location	2713-LIB-57
Archive filter(s) storage location	ESAT Archive
Lab QC Type (Not QC, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Lab Blank
Estimated Particulate Loading (%)	1

F-Factor Calculation (Indirect Preps Only):
Enter data in appropriate cells provided to the right----->

Recording Rules:

Minimum Aspect Ratio (circle one):
none ≥ 3:1 ≥ 5:1

Minimum Length (um): 5

Minimum Width (um): 0.25

Stopping Rules:

Target Sensitivity: _____

Max Area Examined: 0.1

Target # of Structures: _____

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Mineral Desc	EDXA	Sketch/ Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
I1	E2	ND																
	E4	ND																
	E6	ND																
	E8	ND																
	E10	ND																
I3	I2	ND																
	I4	ND																
	I6	ND																
	I8	ND																
	I10	ND																

F-factor Calculation:

Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

CH = Chrysotile

NAM = Non-asbestos material

Are prepped grids acceptable for analysis? (circle one) Yes No
If No, explain: _____

If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below.

Analyzed by:	
Analysis date:	
Instrument:	

Grid opening traverse direction (circle one):

H Horizontal
V Vertical

SUPPLEMENTAL AIR ANALYSIS:

	Achieved sensitivity (cc ⁻¹) from the original analysis
--	---

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

RS

Laboratory ID:	EMSL27
Instrument ID	JEOL 100 CX II (27-2)
Voltage (KV)	100
Mag.	4,800 X
Grid opening area (mm2)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	360
Category (Field, Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00012	Tag:	AL1
Matrix (A=Air, D=Dust, DF = Dustfall):	A		
Air volume (L), dust area (cm2), or dustfall container area (cm2)	687		
Date received by lab	5/21/2013		
Lab Job Number:	271300244		
Lab Sample Number:	271300244-0004		
Number of grids prepared	10		
Prepared by	D. Barney		
Preparation date	9/15/09		
EPA COC Number:	0412-003		
Secondary filter pore size (um)	0.2		

Analyzed by:	E.Wyatt-Pescador
Analysis date	6/26/2013
Method (D=Direct, I=Indirect, IA=indirect-ashed)	D
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	No
Analysis Method (TEM-ISO, TEM-AHERA, TEM-ASTM)	TEM-ISO
Grid storage location	2713-LIB-56
Archive filter(s) storage location	ESAT Archive
Lab QC Type (Not QC, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Recount Same
Estimated Particulate Loading (%)	7

F-Factor Calculation (Indirect Preps Only):
Enter data in appropriate cells provided to the right----->

Recording Rules:

Minimum Aspect Ratio (circle one):
none ≥ 3:1 ≥ 5:1

Minimum Length (um): 5

Minimum Width (um): 0.25

Stopping Rules:

Target Sensitivity: 0.0004

Max Area Examined: 10

Target # of Structures: 25

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Mineral Desc	EDXA	Sketch/ Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
G1	A1	ND																
	A3	ND																
	A5	ND																
	A7	ND																
	A9	ND																
G3	A2	ND																
	A4	ND																
	A6	ND																
	A8	ND																
	A10	ND																

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

LA = Libby-type amphibole OA = Other (non-Libby type) amphibole CH = Chrysotile NAM = Non-asbestos material

Are prepped grids acceptable for analysis? (circle one) Yes No
If No, explain:

264

If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below.

Analyzed by:	
Analysis date:	
Instrument:	

Grid opening traverse direction (circle one):

H Horizontal
V Vertical

SUPPLEMENTAL AIR ANALYSIS:

Achieved sensitivity (cc⁻¹) from the original analysis

Indirect Preparation Record

INDIRECT PREPARATION RECORD
REVISION 1
FEBRUARY 9, 2009

TEM Air
(Circle One)

TEM Dust

PCM

EFA 360 (mm2)

Prepped by:		Indirect without ashing			Dilution Filtration						Indirect with Ashing			OK to Prep to Grid?
Date:	Order ID	Fraction of filter used	1st Resuspend Volume mL	Volume applied to filter mL	Volume of 1st Resuspend used mL	2nd Re-suspend Volume mL	Volume applied to filter mL	Volume of 2nd Re-suspend used mL	3rd Re-suspend Volume mL	Volume applied to filter mL	Fraction of filter ashed	Volume used to resuspend residue mL	Volume applied to 2nd filter mL	Y/N
EJWP	270900045										1/2	100	10	
													15	
													25	
													50	y
	BA-0001										1/2	100	10	
													15	
													25	y
													50	
	BA-0002										1/2	100	10	
													15	
													25	y
													50	
	BA-0003										1/2	100	10	
													15	
													25	
													50	y
	BA-0005										1/2	100	10	
													15	
													25	y
													50	
	BA-00038										1/2	100	10	
													15	
													25	
													50	y
	FilBlank										1/2	100	100	y
	AshBlank										1/2	100	100	y
	MB										1/2	100	100	y

265

Indirect Preparation Record

INDIRECT PREPARATION RECORD
REVISION 1
FEBRUARY 9, 2009

TEM Air
(Circle One)

TEM Dust

PCM

EFA 360 (mm2)

Prepped by: Date:		Indirect without ashing			Dilution Filtration						Indirect with Ashing			OK to Prep to Grid?
Order ID	Sample #	Fraction of filter used	1st Resuspend Volume mL	Volume applied to filter mL	Volume of 1st Resuspend used mL	2nd Re-suspend Volume mL	Volume applied to filter mL	Volume of 2nd Re-suspend used mL	3rd Re-suspend Volume mL	Volume applied to filter mL	Fraction of filter ashed	Volume used to resuspend residue mL	Volume applied to 2nd filter mL	Y/N
270900045	BA00001										1/2	100	10	
													15	
													25	
													50	y
	BA00002										1/2	100	10	
													15	
													25	y
													50	
	BA00037										1/2	100	10	
													15	
													25	y
													50	
	BA00038										1/2	100	10	
													15	
													25	
													50	y
	FilBlank01										1/2	100	100	y
	AshBlank										"	100	100	y
	MB											100	100	y

July 3, 2013

Mr. Doug Kent
TechLaw, Inc.
ESAT Region 8
16194 W. 45th Drive
Golden, CO 80403
303-312-7725

RE: SDG Narrative – TEM Analysis by ISO 10312
EMSL Analytical, Inc. Laboratory Order ID: 271300245

Dear Mr. Kent:

Eight samples were received by the Libby Lab on May 21, 2013 and signed for by the sample receiving clerk. The samples were assigned to an internal EMSL laboratory order ID number of 271300245. Each sample was assigned a unique, sequential laboratory ID number and the job was entered into the Laboratory Information Management System (LIMS). The laboratory ID numbers and the login information are summarized on the EMSL Internal Chain of Custody. Sample condition and signatures are recorded on the original Chain of Custody OU6-052013 submitted by TechLaw, Inc.

These samples were analyzed in accordance with TEM ISO 10312: 1995 Ambient Air Determination of Asbestos Fibres Direct Transfer Transmission Electron Microscopy, as modified by lab modifications specific to the Libby Project.

Results were e-mailed to the Libby Distribution Group and uploaded to the FTP site beginning on July 2, 2013. If you have any questions or require additional information, please do not hesitate to contact me at 856-303-2540.

Sincerely,
EMSL Analytical, Inc.



Charles LaCerra
Special Projects Manager

Chain of Custody Record

271300245

Samples from:

Send to:

Andrea Wandler (406) 295-9151
TechLaw/ESAT Region 8
303 N. 3rd Street
Troy, MT 59935

Roy Pescador (406) 293-9066
EMSL Analytical, Inc.
107 W. 4th Street
Libby, MT 59923

Chain of Custody Number	OU6-052013
Number of Samples	8
Analytical Summary Sheet	SUPPABSOU6-0413 Rev. 0
Date Shipped	

Special Instructions: Samples re-submitted as per EPA request for supplemental analysis. Samples collected during OU6 pedestrian trespasser receptor ABS (September 2008). Samples transferred from COC L14656.

Sample ID	Tag	Sample Date	Matrix	Volume (L)	Filter Pore Size (um)	Low Volume Sample ID	Analysis Requested	Turnaround Time (days)	Media Code	Comments
X BA-00032	AL1	9/22/2008	Air	780	0.8	-	TEM-ISO	30	A	
X BA-00033	AL1	9/22/2008	Air	658	0.8	-	TEM-ISO	30	A	
X BA-00040	AL1	9/23/2008	Air	780	0.8	-	TEM-ISO	30	A	
X BA-00041	AL1	9/23/2008	Air	718	0.8	-	TEM-ISO	30	A	
X BA-00050	AL1	9/24/2008	Air	806	0.8	-	TEM-ISO	30	A	
X BA-00051	AL1	9/24/2008	Air	791	0.8	-	TEM-ISO	30	A	
X BA-00061	AL1	9/25/2008	Air	630	0.8	-	TEM-ISO	30	A	
X BA-00062	AL1	9/25/2008	Air	602	0.8	-	TEM-ISO	30	A	

Relinquished by:	Date:	Time:	Received by:	Date:	Sample Condition:
<i>Dee Brown TechLaw</i>	<i>05/21/13</i>	<i>12:38</i>	<i>Dee Brown EMSL</i>	<i>05/21/13</i>	<i>OK ACCEPT</i>
Relinquished by:	Date:	Time:	Received by:	Date:	Sample Condition:

INTERNAL CHAIN OF CUSTODY

5/28/2013 1:51:41 PM

Order ID: 271300245

Attn: Doug Kent
TechLaw, Inc.
ESAT Region 8
16194 W. 45th Drive
Golden, CO 80403

Customer ID: TECH25
Customer PO:
Received: 05/21/13 12:38 PM

Fax:
Project: **OU6-052013**
Samples collected 9/22, 23, 24, 25/2008

Phone: (303) 312-7725

EMSL Order: 271300245
EMSL Proj ID: Libby
Cust COC ID

Test: TEM ISO 10312

Matrix: Air

TAT: 4 weeks

Qty: 8

Acct Sts: N30

Slsprsn: rdemalo

Logged: kcolberg

Date: 5/21/2013

Inter-Lab Sample Transfer

Samples Relinquished: Date

Samples Received: Date

Package Mailed to Cinnaminson: KC Date 6/20/13

Method of Delivery: Fedex

Includes: (Circle)

☒ Benchsheets ☐ Sample Slides ☐ Sample filters
☐ Micrographs ☐ GridBox ☐ Other

Final Package Received: Date:

Sample Condition: ☒ Acceptable
☐ Unacceptable

Comments

Initial Prep (Initials/Lab): DB **Date:** 6/10/13
Filter Prep (Initials/Lab): DB **Date:** 6/10/13
Grid Prep (Initials/Lab): DB **Date:** 6/10/13

For Special Projects Use Only:

QC Selection: Date:
Date Package Review: Date:
Date Package Mailed: Date:

Special Instructions

Order ID	Lab Sample #	Cust. Sample #	Location	Due Date
271300245	271300245-0001	BA-00032	RS 6/17/2013	7/2/2013 5:00:00 PM
271300245	271300245-0002	BA-00033		7/2/2013 5:00:00 PM
271300245	271300245-0003	BA-00040		7/2/2013 5:00:00 PM
271300245	271300245-0004	BA-00041		7/2/2013 5:00:00 PM
271300245	271300245-0005	BA-00050	RS	7/2/2013 5:00:00 PM
271300245	271300245-0006	BA-00051		7/2/2013 5:00:00 PM
271300245	271300245-0007	BA-00061		7/2/2013 5:00:00 PM
271300245	271300245-0008	BA-00062		7/2/2013 5:00:00 PM

2713-LIB-53 (A-Q)

RS

LIBBY

TEM Asbestos Structure Count -- ISO 10312

EPA Sample Number BA-00032
Tag AL1
Status ANALYZED
Lab QC Type NOT QC
Lab Sample Number 271300245-0001
Matrix Air
Category Field
Prep Direct
Analysis Method TEM-ISO
Est. Particulate Loading 5%

PARAMETERS

Effective filter area 385.0 mm2
F factor 1.00E+00
Number of Grid Openings (amphibole) 50
Number of Grid Openings (chrysotile) 50
Grid opening area 0.013 mm2
Volume (L) or Area (cm2) 780 L
Sensitivity (amphibole) 7.59E-04 s/cc
Sensitivity (chrysotile) 7.59E-04 s/cc
Area Examined (amphibole) 0.650 mm2
Area Examined (chrysotile) 0.650 mm2

Magnification: LOW

Recording Rules:

Min AR	Min length (um)	Min width (um)
3:1	5	0.25

Stopping Rules:

Target Sens.	Max AE (mm ²)	Max N LA
0.0009	10.000	25

COUNTS (based on countable structures only)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0	0	0	0

CONCENTRATION (s/cc)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total: Length > 0.5 um, Aspect Ratio >= 3:1

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

Chi-sq test for filter loading --

p value: 1.0E+00

interpretation: OK

FILE NAME: OU6-052013_BA-00032_271300245-0001_TEM-ISO_AR_06-13-13_D_NotQC_C0.xlsm

FILE TYPE: Original

LIBBY

TEM Asbestos Structure Count

Laboratory ID:	EMSL27		EPA Sample Number:	BA-00032	Tag	AL1		Analyzed by (e.g., M. Smith)	E. Wyatt-Pescador
Instrument ID	OL 100 CX II (27-2)		Matrix	Air				Analysis date	6/13/2013
Voltage (KV)	100		Air volume (L), dust sample area (cm ²), or dustfall container area (cm ²):	780				Prep	Direct
Magnification (do not include X)	4,800	LOW	Date received by lab	5/21/2013				If sample type = air, is there loose material or debris in the cow?*	No
Grid opening area (mm ²)	0.0130		Lab Job Number:	271300245				Analysis Method	TEM-ISO
Scale: 1L =	1.000		Lab Sample Number:	271300245-0001				Analysis Method SOP	ISO 10312
Scale: 1D =	1.000		Number of grids prepared	10				Grid storage location	2713-LIB-53
Primary filter area (mm ²)	385.0		Prepared by (e.g., M. Smith)	D. Barney				Archive filter(s) storage location	Cinnaminson
Secondary Filter Area (mm ²)	360.0		Preparation date	6/10/2013					
Category	Field		EPA COC Number	OU6-052013				F- factor	1
Filter Status	ANALYZED		Estimated Particulate Loading (%)	5%				Lab QC Type	NOT QC

COMMENTS

--

Recording Rules:

3:1	Minimum Aspect Ratio
5.00	Minimum Length (um)
0.25	Minimum Width (um)

Stopping Rules:

0.00090	Target Sensitivity
43	GOs required to reach target
10.000	Maximum Area Examined (mm ²)
770	GOs required to reach max area
25	Maximum # of Structures
43	Estimated # of GOs required

F-factor Calculation:

Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

F-factor

Grid opening traverse direction:	V
----------------------------------	---

Supplemental Air Analysis

☐ Check box if supplemental analysisAchieved sensitivity (cc⁻¹) from the original analysis

Note: When the box is checked above, the est. # of GOs required that is calculated will automatically take into account the GOs examined during the original analysis.

LIBBY
TEM Asbestos Structure Count

OU6-052013_BA-00032_271300245-0001_TEM-ISO_AR_06-13-13_D_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00032
LAB SAMPLE ID: 271300245-0001

Matrix: Air
Analysis Method: TEM-ISO

Prep: Direct
QC Type: NotQC

ERROR CHECK
OK - No errors found

Data Entry by (e.g., M. Smith): A. Fearfield
Data Entry date: 6/17/2013
QA by (e.g., M. Smith): M. Smollock
QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A1	B2	ND																
A1	B4	ND																
A1	B6	ND																
A1	B8	ND																
A1	B10	ND																
A1	C1	ND																
A1	C3	ND																
A1	C5	ND																
A1	C7	ND																
A1	C9	ND																
A1	D2	ND																
A1	D4	ND																
A1	D6	ND																
A1	D8	ND																
A1	D10	ND																
A1	E1	ND																
A1	E3	ND																
A1	E5	ND																
A1	E7	ND																
A1	E9	ND																
A1	F2	ND																
A1	F4	ND																
A1	F6	ND																
A1	F8	ND																
A1	F10	ND																
A3	A2	ND																
A3	A4	ND																
A3	A6	ND																
A3	A8	ND																
A3	A10	ND																
A3	B1	ND																
A3	B3	ND																
A3	B5	ND																
A3	B7	ND																
A3	B9	ND																
A3	C2	ND																
A3	C4	ND																
A3	C6	ND																
A3	C8	ND																
A3	C10	ND																
A3	D1	ND																
A3	D3	ND																
A3	D5	ND																
A3	D7	ND																
A3	D9	ND																
A3	E2	ND																
A3	E4	ND																
A3	E6	ND																
A3	E8	ND																
A3	E10	ND																

LIBBY

TEM Asbestos Structure Count -- ISO 10312

EPA Sample Number BA-00033
Tag AL1
Status ANALYZED
Lab QC Type NOT QC
Lab Sample Number 271300245-0002
Matrix Air
Category Field
Prep Direct
Analysis Method TEM-ISO
Est. Particulate Loading 4%

PARAMETERS

Effective filter area 385.0 mm2
F factor 1.00E+00
Number of Grid Openings (amphibole) 55
Number of Grid Openings (chrysotile) 55
Grid opening area 0.013 mm2
Volume (L) or Area (cm2) 658 L
Sensitivity (amphibole) 8.18E-04 s/cc
Sensitivity (chrysotile) 8.18E-04 s/cc
Area Examined (amphibole) 0.715 mm2
Area Examined (chrysotile) 0.715 mm2

Magnification: LOW

Recording Rules:

Min AR	Min length (um)	Min width (um)
3:1	5	0.25

Stopping Rules:

Target Sens.	Max AE (mm ²)	Max N LA
0.0009	10.000	25

COUNTS (based on countable structures only)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0	0	0	0

CONCENTRATION (s/cc)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total: Length > 0.5 um, Aspect Ratio >= 3:1

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

Chi-sq test for filter loading --

p value: 1.0E+00

interpretation: OK

FILE NAME: OU6-052013_BA-00033_271300245-0002_TEM-ISO_AR_06-13-13_D_NotQC_C0.xlsm

FILE TYPE: Original

LIBBY

TEM Asbestos Structure Count

Laboratory ID:	EMSL27	▼
Instrument ID	OL 100 CX II (27-2)	
Voltage (KV)	100	
Magnification (do not include X)	4,800	LOW
Grid opening area (mm ²)	0.0130	
Scale: 1L =	1.000	
Scale: 1D =	1.000	
Primary filter area (mm ²)	385.0	
Secondary Filter Area (mm ²)	360.0	
Category	Field	▼
Filter Status	ANALYZED	▼

EPA Sample Number:	BA-00033	Tag	AL1	▼
Matrix	Air		▼	
Air volume (L), dust sample area (cm ²), or dustfall container area (cm ²):	658			
Date received by lab	5/21/2013			
Lab Job Number:	271300245			
Lab Sample Number:	271300245-0002			
Number of grids prepared	10			
Prepared by (e.g., M. Smith)	D. Barney			
Preparation date	6/10/2013			
EPA COC Number	OU6-052013			
Estimated Particulate Loading (%)	4%			

Analyzed by (e.g., M. Smith)	E. Wyatt-Pescador	
Analysis date	6/13/2013	
Prep	Direct	▼
If sample type = air, is there loose material or debris in the cowl?	No	▼
Analysis Method	TEM-ISO	▼
Analysis Method SOP	ISO 10312	
Grid storage location	2713-LIB-53	
Archive filter(s) storage location	Cinnaminson	
F- factor	1	
Lab QC Type	NOT QC	▼

Recording Rules:

3:1	▼	Minimum Aspect Ratio
5.00		Minimum Length (um)
0.25		Minimum Width (um)

Stopping Rules:

0.00090	Target Sensitivity
51	GOs required to reach target
10.000	Maximum Area Examined (mm ²)
770	GOs required to reach max area
25	Maximum # of Structures
51	Estimated # of GOs required

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction: V

Supplemental Air Analysis

☐ Check box if supplemental analysis

Achieved sensitivity (cc⁻¹) from the original analysis

Note: When the box is checked above, the est. # of GOs required that is calculated will automatically take into account the GOs examined during the original analysis.

COMMENTS

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LIBBY
TEM Asbestos Structure Count

OU6-052013_BA-00033_271300245-0002_TEM-ISO_AR_06-13-13_D_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00033
 LAB SAMPLE ID: 271300245-0002

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Direct
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): A. Fearfield
 Data Entry date: 6/17/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
C1	A2	ND																
C1	A4	ND																
C1	A6	ND																
C1	A8	ND																
C1	A10	ND																
C1	B1	ND																
C1	B3	ND																
C1	B5	ND																
C1	B7	ND																
C1	B9	ND																
C1	C2	ND																
C1	C4	ND																
C1	C6	ND																
C1	C8	ND																
C1	C10	ND																
C1	D1	ND																
C1	D3	ND																
C1	D5	ND																
C1	D7	ND																
C1	D9	ND																
C1	E2	ND																
C1	E4	ND																
C1	E6	ND																
C1	E8	ND																
C1	E10	ND																
C3	B2	ND																
C3	B4	ND																
C3	B6	ND																
C3	B8	ND																
C3	B10	ND																
C3	C1	ND																
C3	C3	ND																
C3	C5	ND																
C3	C7	ND																
C3	C9	ND																
C3	D2	ND																
C3	D4	ND																
C3	D6	ND																
C3	D8	ND																
C3	D10	ND																
C3	E1	ND																
C3	E3	ND																
C3	E5	ND																
C3	E7	ND																
C3	E9	ND																
C3	F2	ND																
C3	F4	ND																
C3	F6	ND																
C3	F8	ND																
C3	F10	ND																
C3	G1	ND																
C3	G3	ND																
C3	G5	ND																
C3	G7	ND																
C3	G9	ND																

LIBBY

TEM Asbestos Structure Count -- ISO 10312

EPA Sample Number BA-00040
Tag AL1
Status ANALYZED
Lab QC Type NOT QC
Lab Sample Number 271300245-0003
Matrix Air
Category Field
Prep Direct
Analysis Method TEM-ISO
Est. Particulate Loading 4%

PARAMETERS

Effective filter area 385.0 mm2
F factor 1.00E+00
Number of Grid Openings (amphibole) 55
Number of Grid Openings (chrysotile) 55
Grid opening area 0.013 mm2
Volume (L) or Area (cm2) 780 L
Sensitivity (amphibole) 6.90E-04 s/cc
Sensitivity (chrysotile) 6.90E-04 s/cc
Area Examined (amphibole) 0.715 mm2
Area Examined (chrysotile) 0.715 mm2

Magnification: LOW

Recording Rules:

Min AR	Min length (um)	Min width (um)
3:1	5	0.25

Stopping Rules:

Target Sens.	Max AE (mm ²)	Max N LA
0.0009	10.000	25

COUNTS (based on countable structures only)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0	0	0	0

CONCENTRATION (s/cc)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total: Length > 0.5 um, Aspect Ratio >= 3:1

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

Chi-sq test for filter loading --

p value: 1.0E+00

interpretation: OK

LIBBY

TEM Asbestos Structure Count

Laboratory ID:	EMSL27	▼
Instrument ID	OL 100 CX II (27-2)	
Voltage (KV)	100	
Magnification (do not include X)	4,800	LOW
Grid opening area (mm ²)	0.0130	
Scale: 1L =	1.000	
Scale: 1D =	1.000	
Primary filter area (mm ²)	385.0	
Secondary Filter Area (mm ²)	360.0	
Category	Field	▼
Filter Status	ANALYZED	▼

EPA Sample Number:	BA-00040	Tag	AL1	▼
Matrix	Air		▼	
Air volume (L), dust sample area (cm ²), or dustfall container area (cm ²):	780			
Date received by lab	5/21/2013			
Lab Job Number:	271300245			
Lab Sample Number:	271300245-0003			
Number of grids prepared	10			
Prepared by (e.g., M. Smith)	D. Barney			
Preparation date	6/10/2013			
EPA COC Number	OU6-052013			
Estimated Particulate Loading (%)	4%			

Analyzed by (e.g., M. Smith)	E. Wyatt-Pescador	
Analysis date	6/13/2013	
Prep	Direct	▼
If sample type = air, is there loose material or debris in the bowl?	No	▼
Analysis Method	TEM-ISO	
Analysis Method SOP	ISO 10312	
Grid storage location	2713-LIB-53	
Archive filter(s) storage location	Cinnaminson	
F- factor	1	
Lab QC Type	NOT QC	▼

Recording Rules:

3:1	▼	Minimum Aspect Ratio
5.00		Minimum Length (um)
0.25		Minimum Width (um)

Stopping Rules:

0.00090	Target Sensitivity
43	GOs required to reach target
10.000	Maximum Area Examined (mm ²)
770	GOs required to reach max area
25	Maximum # of Structures
43	Estimated # of GOs required

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction: V

Supplemental Air Analysis

☐ Check box if supplemental analysis

Achieved sensitivity (cc⁻¹) from the original analysis

Note: When the box is checked above, the est. # of GOs required that is calculated will automatically take into account the GOs examined during the original analysis.

COMMENTS

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LIBBY
TEM Asbestos Structure Count

OU6-052013_BA-00040_271300245-0003_TEM-ISO_AR_06-13-13_D_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00040
LAB SAMPLE ID: 271300245-0003

Matrix: Air
Analysis Method: TEM-ISO

Prep: Direct
QC Type: NotQC

ERROR CHECK

OK - No errors found

Data Entry by (e.g., M. Smith): A. Fearfield
Data Entry date: 6/17/2013
QA by (e.g., M. Smith): M. Smollock
QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
E1	A1	ND																
E1	A3	ND																
E1	A5	ND																
E1	A7	ND																
E1	A9	ND																
E1	B2	ND																
E1	B4	ND																
E1	B6	ND																
E1	B8	ND																
E1	B10	ND																
E1	C1	ND																
E1	C3	ND																
E1	C5	ND																
E1	C7	ND																
E1	C9	ND																
E1	D2	ND																
E1	D4	ND																
E1	D6	ND																
E1	D8	ND																
E1	D10	ND																
E1	E1	ND																
E1	E3	ND																
E1	E5	ND																
E1	E7	ND																
E1	E9	ND																
E3	A2	ND																
E3	A4	ND																
E3	A6	ND																
E3	A8	ND																
E3	A10	ND																
E3	B1	ND																
E3	B3	ND																
E3	B5	ND																
E3	B7	ND																
E3	B9	ND																
E3	C2	ND																
E3	C4	ND																
E3	C6	ND																
E3	C8	ND																
E3	C10	ND																
E3	D1	ND																
E3	D3	ND																
E3	D5	ND																
E3	D7	ND																
E3	D9	ND																
E3	E2	ND																
E3	E4	ND																
E3	E6	ND																
E3	E8	ND																
E3	E10	ND																
E3	F1	ND																
E3	F3	ND																
E3	F5	ND																
E3	F7	ND																
E3	F9	ND																

LIBBY

TEM Asbestos Structure Count -- ISO 10312

EPA Sample Number BA-00041
Tag AL1
Status ANALYZED
Lab QC Type NOT QC
Lab Sample Number 271300245-0004
Matrix Air
Category Field
Prep Direct
Analysis Method TEM-ISO
Est. Particulate Loading 4%

PARAMETERS

Effective filter area 385.0 mm2
F factor 1.00E+00
Number of Grid Openings (amphibole) 50
Number of Grid Openings (chrysotile) 50
Grid opening area 0.013 mm2
Volume (L) or Area (cm2) 718 L
Sensitivity (amphibole) 8.25E-04 s/cc
Sensitivity (chrysotile) 8.25E-04 s/cc
Area Examined (amphibole) 0.650 mm2
Area Examined (chrysotile) 0.650 mm2

Magnification: LOW

Recording Rules:

Min AR	Min length (um)	Min width (um)
3:1	5	0.25

Stopping Rules:

Target Sens.	Max AE (mm ²)	Max N LA
0.0009	10.000	25

COUNTS (based on countable structures only)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0	0	0	0

CONCENTRATION (s/cc)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total: Length > 0.5 um, Aspect Ratio >= 3:1

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

Chi-sq test for filter loading --

p value: 1.0E+00

interpretation: OK

FILE NAME: OU6-052013_BA-00041_271300245-0004_TEM-ISO_AR_06-14-13_D_NotQC_C0.xlsm

FILE TYPE: Original

LIBBY

TEM Asbestos Structure Count

Laboratory ID:	EMSL27	▼
Instrument ID	OL 100 CX II (27-2)	
Voltage (KV)	100	
Magnification (do not include X)	4,800	LOW
Grid opening area (mm ²)	0.0130	
Scale: 1L =	1.000	
Scale: 1D =	1.000	
Primary filter area (mm ²)	385.0	
Secondary Filter Area (mm ²)	360.0	
Category	Field	▼
Filter Status	ANALYZED	▼

EPA Sample Number:	BA-00041	Tag	AL1	▼
Matrix	Air		▼	
Air volume (L), dust sample area (cm ²), or dustfall container area (cm ²):	718			
Date received by lab	5/21/2013			
Lab Job Number:	2713000245			
Lab Sample Number:	271300245-0004			
Number of grids prepared	10			
Prepared by (e.g., M. Smith)	D. Barney			
Preparation date	6/10/2013			
EPA COC Number	OU6-052013			
Estimated Particulate Loading (%)	4%			

Analyzed by (e.g., M. Smith)	E. Wyatt-Pescador	
Analysis date	6/14/2013	
Prep	Direct	▼
If sample type = air, is there loose material or debris in the cowl?	No	▼
Analysis Method	TEM-ISO	▼
Analysis Method SOP	ISO 10312	
Grid storage location	2713-LIB-53	
Archive filter(s) storage location	Cinnaminson	
F- factor	1	
Lab QC Type	NOT QC	▼

Recording Rules:

3:1	▼	Minimum Aspect Ratio
5.00		Minimum Length (um)
0.25		Minimum Width (um)

Stopping Rules:

0.00090	Target Sensitivity
46	GOs required to reach target
10.000	Maximum Area Examined (mm ²)
770	GOs required to reach max area
25	Maximum # of Structures
46	Estimated # of GOs required

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

V

Supplemental Air Analysis

☐ Check box if supplemental analysis

Achieved sensitivity (cc⁻¹) from the original analysis

Note: When the box is checked above, the est. # of GOs required that is calculated will automatically take into account the GOs examined during the original analysis.

COMMENTS

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LIBBY
TEM Asbestos Structure Count

OU6-052013_BA-00041_271300245-0004_TEM-ISO_AR_06-14-13_D_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00041
 LAB SAMPLE ID: 271300245-0004

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Direct
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): A. Fearfield
 Data Entry date: 6/17/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
G1	B1	ND																
G1	B3	ND																
G1	B5	ND																
G1	B7	ND																
G1	B9	ND																
G1	C2	ND																
G1	C4	ND																
G1	C6	ND																
G1	C8	ND																
G1	C10	ND																
G1	D1	ND																
G1	D3	ND																
G1	D5	ND																
G1	D7	ND																
G1	D9	ND																
G1	E2	ND																
G1	E4	ND																
G1	E6	ND																
G1	E8	ND																
G1	E10	ND																
G1	F1	ND																
G1	F3	ND																
G1	F5	ND																
G1	F7	ND																
G1	F9	ND																
G3	A1	ND																
G3	A3	ND																
G3	A5	ND																
G3	A7	ND																
G3	A9	ND																
G3	B2	ND																
G3	B4	ND																
G3	B6	ND																
G3	B8	ND																
G3	B10	ND																
G3	C1	ND																
G3	C3	ND																
G3	C5	ND																
G3	C7	ND																
G3	C9	ND																
G3	D2	ND																
G3	D4	ND																
G3	D6	ND																
G3	D8	ND																
G3	D10	ND																
G3	E2	ND																
G3	E4	ND																
G3	E6	ND																
G3	E8	ND																
G3	E10	ND																

LIBBY

TEM Asbestos Structure Count -- ISO 10312

EPA Sample Number BA-00050
Tag AL1
Status ANALYZED
Lab QC Type NOT QC
Lab Sample Number 271300245-0005
Matrix Air
Category Field
Prep Direct
Analysis Method TEM-ISO
Est. Particulate Loading 4%

PARAMETERS

Effective filter area 385.0 mm2
 F factor 1.00E+00
 Number of Grid Openings (amphibole) 50
 Number of Grid Openings (chrysotile) 50
 Grid opening area 0.013 mm2
 Volume (L) or Area (cm2) 806 L
 Sensitivity (amphibole) 7.35E-04 s/cc
 Sensitivity (chrysotile) 7.35E-04 s/cc
 Area Examined (amphibole) 0.650 mm2
 Area Examined (chrysotile) 0.650 mm2

Magnification:	LOW
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**Recording
Rules:**

Min AR	Min length (um)	Min width (um)
3:1	5	0.25

**Stopping
Rules:**

Target Sens.	Max AE (mm ²)	Max N LA
0.0009	10.000	25

COUNTS (based on countable structures only)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0	0	0	0

CONCENTRATION (s/cc)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total: Length > 0.5 um, Aspect Ratio >= 3:1

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

Chi-sq test for filter loading --

p value: 1.0E+00

interpretation: OK

FILE NAME: OU6-052013_BA-00050_271300245-0005_TEM-ISO_AR_06-14-13_D_NotQC_C0.xlsm

FILE TYPE: Original

LIBBY

TEM Asbestos Structure Count

Laboratory ID:	EMSL27	▼
Instrument ID	OL 100 CX II (27-2)	
Voltage (KV)	100	
Magnification (do not include X)	4,800	LOW
Grid opening area (mm ²)	0.0130	
Scale: 1L =	1.000	
Scale: 1D =	1.000	
Primary filter area (mm ²)	385.0	
Secondary Filter Area (mm ²)	360.0	
Category	Field	▼
Filter Status	ANALYZED	▼

EPA Sample Number:	BA-00050	Tag	AL1	▼
Matrix	Air		▼	
Air volume (L), dust sample area (cm ²), or dustfall container area (cm ²):	806			
Date received by lab	5/21/2013			
Lab Job Number:	271300245			
Lab Sample Number:	271300245-0005			
Number of grids prepared	10			
Prepared by (e.g., M. Smith)	D. Barney			
Preparation date	6/10/2013			
EPA COC Number	OU6-052013			
Estimated Particulate Loading (%)	4%			

Analyzed by (e.g., M. Smith)	E. Wyatt-Pescador	
Analysis date	6/14/2013	
Prep	Direct	▼
If sample type = air, is there loose material or debris in the bowl?	No	▼
Analysis Method	TEM-ISO	
Analysis Method SOP	ISO 10312	
Grid storage location	2713-LIB-53	
Archive filter(s) storage location	Cinnaminson	
F- factor	1	
Lab QC Type	NOT QC	▼

Recording Rules:

3:1	▼	Minimum Aspect Ratio
5.00		Minimum Length (um)
0.25		Minimum Width (um)

Stopping Rules:

0.00090	Target Sensitivity
41	GOs required to reach target
10.000	Maximum Area Examined (mm ²)
770	GOs required to reach max area
25	Maximum # of Structures
41	Estimated # of GOs required

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction: V

Supplemental Air Analysis

☐ Check box if supplemental analysis

Achieved sensitivity (cc⁻¹) from the original analysis

Note: When the box is checked above, the est. # of GOs required that is calculated will automatically take into account the GOs examined during the original analysis.

COMMENTS

LIBBY
TEM Asbestos Structure Count

OU6-052013_BA-00050_271300245-0005_TEM-ISO_AR_06-14-13_D_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00050
 LAB SAMPLE ID: 271300245-0005

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Direct
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/17/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
I1	A1	ND																
I1	A3	ND																
I1	A5	ND																
I1	A7	ND																
I1	A9	ND																
I1	B2	ND																
I1	B4	ND																
I1	B6	ND																
I1	B8	ND																
I1	B10	ND																
I1	C1	ND																
I1	C3	ND																
I1	C5	ND																
I1	C7	ND																
I1	C9	ND																
I1	D2	ND																
I1	D4	ND																
I1	D6	ND																
I1	D8	ND																
I1	D10	ND																
I1	E1	ND																
I1	E3	ND																
I1	E5	ND																
I1	E7	ND																
I1	E9	ND																
I3	A2	ND																
I3	A4	ND																
I3	A6	ND																
I3	A8	ND																
I3	A10	ND																
I3	B1	ND																
I3	B3	ND																
I3	B5	ND																
I3	B7	ND																
I3	B9	ND																
I3	C2	ND																
I3	C4	ND																
I3	C6	ND																
I3	C8	ND																
I3	C10	ND																
I3	D1	ND																
I3	D3	ND																
I3	D5	ND																
I3	D7	ND																
I3	D9	ND																
I3	E2	ND																
I3	E4	ND																
I3	E6	ND																
I3	E8	ND																
I3	E10	ND																

LIBBY

TEM Asbestos Structure Count -- ISO 10312

EPA Sample Number BA-00051
Tag AL1
Status ANALYZED
Lab QC Type NOT QC
Lab Sample Number 271300245-0006
Matrix Air
Category Field
Prep Direct
Analysis Method TEM-ISO
Est. Particulate Loading 4%

PARAMETERS

Effective filter area 385.0 mm2
F factor 1.00E+00
Number of Grid Openings (amphibole) 50
Number of Grid Openings (chrysotile) 50
Grid opening area 0.013 mm2
Volume (L) or Area (cm2) 791 L
Sensitivity (amphibole) 7.49E-04 s/cc
Sensitivity (chrysotile) 7.49E-04 s/cc
Area Examined (amphibole) 0.650 mm2
Area Examined (chrysotile) 0.650 mm2

Magnification: LOW

Recording Rules:

Min AR	Min length (um)	Min width (um)
3:1	5	0.25

Stopping Rules:

Target Sens.	Max AE (mm ²)	Max N LA
0.0009	10.000	25

COUNTS (based on countable structures only)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0	0	0	0

CONCENTRATION (s/cc)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total: Length > 0.5 um, Aspect Ratio >= 3:1

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

Chi-sq test for filter loading --

p value: 1.0E+00

interpretation: OK

FILE NAME: OU6-052013_BA-00051_271300245-0006_TEM-ISO_AR_06-14-13_D_NotQC_C0.xlsm

FILE TYPE: Original

LIBBY

TEM Asbestos Structure Count

Laboratory ID:	EMSL27	▼
Instrument ID	OL 100 CX II (27-2)	
Voltage (KV)	100	
Magnification (do not include X)	4,800	LOW
Grid opening area (mm ²)	0.0130	
Scale: 1L =	1.000	
Scale: 1D =	1.000	
Primary filter area (mm ²)	385.0	
Secondary Filter Area (mm ²)	360.0	
Category	Field	▼
Filter Status	ANALYZED	▼

EPA Sample Number:	BA-00051	Tag	AL1	▼
Matrix	Air		▼	
Air volume (L), dust sample area (cm ²), or dustfall container area (cm ²):	791			
Date received by lab	5/21/2013			
Lab Job Number:	271300245			
Lab Sample Number:	271300245-0006			
Number of grids prepared	10			
Prepared by (e.g., M. Smith)	D. Barney			
Preparation date	6/10/2013			
EPA COC Number	OU6-052013			
Estimated Particulate Loading (%)	4%			

Analyzed by (e.g., M. Smith)	E. Wyatt-Pescador	
Analysis date	6/14/2013	
Prep	Direct	▼
If sample type = air, is there loose material or debris in the bowl?	No	▼
Analysis Method	TEM-ISO	▼
Analysis Method SOP	ISO 10312	
Grid storage location	2713-LIB-53	
Archive filter(s) storage location	Cinnaminson	
F- factor	1	
Lab QC Type	NOT QC	▼

Recording Rules:

3:1	▼	Minimum Aspect Ratio
5.00		Minimum Length (um)
0.25		Minimum Width (um)

Stopping Rules:

0.00090	Target Sensitivity
42	GOs required to reach target
10.000	Maximum Area Examined (mm ²)
770	GOs required to reach max area
25	Maximum # of Structures
42	Estimated # of GOs required

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction: V

Supplemental Air Analysis

☐ Check box if supplemental analysis

Achieved sensitivity (cc⁻¹) from the original analysis

Note: When the box is checked above, the est. # of GOs required that is calculated will automatically take into account the GOs examined during the original analysis.

COMMENTS

LIBBY
TEM Asbestos Structure Count

OU6-052013_BA-00051_271300245-0006_TEM-ISO_AR_06-14-13_D_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00051
 LAB SAMPLE ID: 271300245-0006

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Direct
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/17/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
K2	A2	ND																
K2	A4	ND																
K2	A6	ND																
K2	A8	ND																
K2	A10	ND																
K2	B1	ND																
K2	B3	ND																
K2	B5	ND																
K2	B7	ND																
K2	B9	ND																
K2	C2	ND																
K2	C4	ND																
K2	C6	ND																
K2	C8	ND																
K2	C10	ND																
K2	D1	ND																
K2	D3	ND																
K2	D5	ND																
K2	D7	ND																
K2	D9	ND																
K2	E2	ND																
K2	E4	ND																
K2	E6	ND																
K2	E8	ND																
K2	E10	ND																
K4	B2	ND																
K4	B4	ND																
K4	B6	ND																
K4	B8	ND																
K4	B10	ND																
K4	C1	ND																
K4	C3	ND																
K4	C5	ND																
K4	C7	ND																
K4	C9	ND																
K4	D2	ND																
K4	D4	ND																
K4	D6	ND																
K4	D8	ND																
K4	D10	ND																
K4	E1	ND																
K4	E3	ND																
K4	E5	ND																
K4	E7	ND																
K4	E9	ND																
K4	F2	ND																
K4	F4	ND																
K4	F6	ND																
K4	F8	ND																
K4	F10	ND																

LIBBY

TEM Asbestos Structure Count -- ISO 10312

EPA Sample Number BA-00061
Tag AL1
Status ANALYZED
Lab QC Type NOT QC
Lab Sample Number 271300245-0007
Matrix Air
Category Field
Prep Direct
Analysis Method TEM-ISO
Est. Particulate Loading 4%

PARAMETERS
Effective filter area 385.0 mm2
F factor 1.00E+00
Number of Grid Openings (amphibole) 53
Number of Grid Openings (chrysotile) 53
Grid opening area 0.013 mm2
Volume (L) or Area (cm2) 630 L
Sensitivity (amphibole) 8.87E-04 s/cc
Sensitivity (chrysotile) 8.87E-04 s/cc
Area Examined (amphibole) 0.689 mm2
Area Examined (chrysotile) 0.689 mm2

Magnification: LOW

Recording Rules:

Min AR	Min length (um)	Min width (um)
3:1	5	0.25

Stopping Rules:

Target Sens.	Max AE (mm ²)	Max N LA
0.0009	10.000	25

COUNTS (based on countable structures only)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0	0	0	0

CONCENTRATION (s/cc)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total: Length > 0.5 um, Aspect Ratio >= 3:1

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

Chi-sq test for filter loading --

p value: 1.0E+00

interpretation: OK

LIBBY

TEM Asbestos Structure Count

Laboratory ID:	EMSL27	▼	EPA Sample Number:	BA-00061	Tag	AL1	▼
Instrument ID	OL 100 CX II (27-2)		Matrix	Air		▼	
Voltage (KV)	100		Air volume (L), dust sample area (cm ²), or dustfall container area (cm ²):	630			
Magnification (do not include X)	4,800	LOW	Date received by lab	5/21/2013			
Grid opening area (mm ²)	0.0130		Lab Job Number:	271300245			
Scale: 1L =	1.000		Lab Sample Number:	271300245-0007			
Scale: 1D =	1.000		Number of grids prepared	10			
Primary filter area (mm ²)	385.0		Prepared by (e.g., M. Smith)	D. Barney			
Secondary Filter Area (mm ²)	360.0		Preparation date	6/10/2013			
Category	Field	▼	EPA COC Number	OU6-052013			
Filter Status	ANALYZED		Estimated Particulate Loading (%)	4%			

COMMENTS

Also analyzed on 7/1/13.

Analyzed by (e.g., M. Smith)	E. Wyatt-Pescador	
Analysis date	6/14/2013	
Prep	Direct	▼
If sample type = air, is there loose material or debris in the cowl?	No	▼
Analysis Method	TEM-ISO	
Analysis Method SOP	ISO 10312	
Grid storage location	2713-LIB-53	
Archive filter(s) storage location	Cinnaminson	
F- factor	1	
Lab QC Type	NOT QC	▼

Recording Rules:

3:1	▼	Minimum Aspect Ratio
5.00		Minimum Length (um)
0.25		Minimum Width (um)

Stopping Rules:

0.00090	Target Sensitivity
53	GOs required to reach target
10.000	Maximum Area Examined (mm ²)
770	GOs required to reach max area
25	Maximum # of Structures
53	Estimated # of GOs required

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction:

V

Supplemental Air Analysis

☐ Check box if supplemental analysisAchieved sensitivity (cc⁻¹) from the original analysis

Note: When the box is checked above, the est. # of GOs required that is calculated will automatically take into account the GOs examined during the original analysis.

LIBBY
TEM Asbestos Structure Count

OU6-052013_BA-00061_271300245-0007_TEM-ISO_AR_06-14-13_D_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00061
 LAB SAMPLE ID: 271300245-0007

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Direct
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/17/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/2/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
M2	A1	ND																
M2	A3	ND																
M2	A5	ND																
M2	A7	ND																
M2	A9	ND																
M2	B2	ND																
M2	B4	ND																
M2	B6	ND																
M2	B8	ND																
M2	B10	ND																
M2	C1	ND																
M2	C3	ND																
M2	C5	ND																
M2	C7	ND																
M2	C9	ND																
M2	D2	ND																
M2	D4	ND																
M2	D6	ND																
M2	D8	ND																
M2	D10	ND																
M2	E1	ND																
M2	E3	ND																
M2	E5	ND																
M2	E7	ND																
M2	E9	ND																
M4	A2	ND																
M4	A4	ND																
M4	A6	ND																
M4	A8	ND																
M4	A10	ND																
M4	B1	ND																
M4	B3	ND																
M4	B5	ND																
M4	B7	ND																
M4	B9	ND																
M4	C2	ND																
M4	C4	ND																
M4	C6	ND																
M4	C8	ND																
M4	C10	ND																
M4	D1	ND																
M4	D3	ND																
M4	D5	ND																
M4	D7	ND																
M4	D9	ND																
M4	E2	ND																
M4	E4	ND																
M4	E6	ND																
M4	E8	ND																
M4	E10	ND																
M6	B1	ND																
M6	B3	ND																
M6	B5	ND																

LIBBY

TEM Asbestos Structure Count -- ISO 10312

EPA Sample Number BA-00062
Tag AL1
Status ANALYZED
Lab QC Type NOT QC
Lab Sample Number 271300245-0008
Matrix Air
Category Field
Prep Direct
Analysis Method TEM-ISO
Est. Particulate Loading 3%

PARAMETERS

Effective filter area 385.0 mm2
F factor 1.00E+00
Number of Grid Openings (amphibole) 60
Number of Grid Openings (chrysotile) 60
Grid opening area 0.013 mm2
Volume (L) or Area (cm2) 602 L
Sensitivity (amphibole) 8.20E-04 s/cc
Sensitivity (chrysotile) 8.20E-04 s/cc
Area Examined (amphibole) 0.780 mm2
Area Examined (chrysotile) 0.780 mm2

Magnification: LOW

Recording Rules:

Min AR	Min length (um)	Min width (um)
3:1	5	0.25

Stopping Rules:

Target Sens.	Max AE (mm ²)	Max N LA
0.0009	10.000	25

COUNTS (based on countable structures only)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0	0	0	0

CONCENTRATION (s/cc)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total: Length > 0.5 um, Aspect Ratio >= 3:1

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

Chi-sq test for filter loading --

p value: 1.0E+00

interpretation: OK

LIBBY

TEM Asbestos Structure Count

Laboratory ID:	EMSL27	EPA Sample Number:	BA-00062	Tag	AL1
Instrument ID	OL 100 CX II (27-2)	Matrix	Air		
Voltage (KV)	100	Air volume (L), dust sample area (cm ²), or dustfall container area (cm ²):	602		
Magnification (do not include X)	4,800	Date received by lab	5/21/2013		
Grid opening area (mm ²)	0.0130	Lab Job Number:	271300245		
Scale: 1L =	1.000	Lab Sample Number:	271300245-0008		
Scale: 1D =	1.000	Number of grids prepared	10		
Primary filter area (mm ²)	385.0	Prepared by (e.g., M. Smith)	D. Barney		
Secondary Filter Area (mm ²)	360.0	Preparation date	6/10/2013		
Category	Field	EPA COC Number	OU6-052013		
Filter Status	ANALYZED	Estimated Particulate Loading (%)	3%		

Analyzed by (e.g., M. Smith)	E. Wyatt-Pescador	
Analysis date	6/14/2013	
Prep	Direct	
If sample type = air, is there loose material or debris in the bowl?	No	
Analysis Method	TEM-ISO	
Analysis Method SOP	ISO 10312	
Grid storage location	2713-LIB-53	
Archive filter(s) storage location	Cinnaminson	
F- factor	1	
Lab QC Type	NOT QC	

Recording Rules:

3:1	Minimum Aspect Ratio
5.00	Minimum Length (um)
0.25	Minimum Width (um)

Stopping Rules:

0.00090	Target Sensitivity
55	GOs required to reach target
10.000	Maximum Area Examined (mm ²)
770	GOs required to reach max area
25	Maximum # of Structures
55	Estimated # of GOs required

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing
[For dust and dustfall, enter 1.0]

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

F-factor

Grid opening traverse direction: V

Supplemental Air Analysis

☐ Check box if supplemental analysis

Achieved sensitivity (cc⁻¹) from the original analysis

Note: When the box is checked above, the est. # of GOs required that is calculated will automatically take into account the GOs examined during the original analysis.

COMMENTS

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LIBBY
TEM Asbestos Structure Count

OU6-052013_BA-00062_271300245-0008_TEM-ISO_AR_06-14-13_D_NotQC_C0.xlsm

EPA SAMPLE ID: BA-00062
 LAB SAMPLE ID: 271300245-0008

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Direct
 QC Type: NotQC

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): B. Gallagher
 Data Entry date: 6/17/2013
 QA by (e.g., M. Smith): M. Smollock
 QA date: 7/1/2013

Target Sensitivity Reached-Complete current GO, then stop.

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
O2	D2	ND																
O2	D4	ND																
O2	D6	ND																
O2	D8	ND																
O2	D10	ND																
O2	E1	ND																
O2	E3	ND																
O2	E5	ND																
O2	E7	ND																
O2	E9	ND																
O2	F2	ND																
O2	F4	ND																
O2	F6	ND																
O2	F8	ND																
O2	F10	ND																
O2	G1	ND																
O2	G3	ND																
O2	G5	ND																
O2	G7	ND																
O2	G9	ND																
O2	H2	ND																
O2	H4	ND																
O2	H6	ND																
O2	H8	ND																
O2	H10	ND																
O2	I1	ND																
O2	I3	ND																
O2	I5	ND																
O2	I7	ND																
O2	I9	ND																
O4	B2	ND																
O4	B4	ND																
O4	B6	ND																
O4	B8	ND																
O4	B10	ND																
O4	C1	ND																
O4	C3	ND																
O4	C5	ND																
O4	C7	ND																
O4	C9	ND																
O4	D2	ND																
O4	D4	ND																
O4	D6	ND																
O4	D8	ND																
O4	D10	ND																
O4	E1	ND																
O4	E3	ND																
O4	E5	ND																
O4	E7	ND																
O4	E9	ND																
O4	F2	ND																
O4	F4	ND																
O4	F6	ND																
O4	F8	ND																
O4	F10	ND																
O4	G1	ND																
O4	G3	ND																
O4	G5	ND																
O4	G7	ND																
O4	G9	ND																

LIBBY

TEM Asbestos Structure Count -- ISO 10312

EPA Sample Number BA-00050
Tag AL1
Status ANALYZED
Lab QC Type Recount Same
Lab Sample Number 271300245-0005
Matrix Air
Category Field
Prep Direct
Analysis Method TEM-ISO
Est. Particulate Loading 4%

PARAMETERS

Effective filter area 385.0 mm2
F factor 1.00E+00
Number of Grid Openings (amphibole) 10
Number of Grid Openings (chrysotile) 10
Grid opening area 0.013 mm2
Volume (L) or Area (cm2) 806 L
Sensitivity (amphibole) 3.67E-03 s/cc
Sensitivity (chrysotile) 3.67E-03 s/cc
Area Examined (amphibole) 0.130 mm2
Area Examined (chrysotile) 0.130 mm2

Magnification: **LOW**

Recording Rules:

Min AR	Min length (um)	Min width (um)
3:1	5	0.25

Stopping Rules:

Target Sens.	Max AE (mm ²)	Max N LA
0.0009	10.000	25

COUNTS (based on countable structures only)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0	0	0	0

CONCENTRATION (s/cc)

Bin	LA	OA	CH	All Asbestos
Total				
PCME	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total: Length > 0.5 um, Aspect Ratio >= 3:1

PCME: Length > 5 um, Width >= 0.25 um, Aspect Ratio >= 3:1

Chi-sq test for filter loading --

p value: 1.0E+00

interpretation: OK

FILE NAME: OU6-052013_BA-00050_271300245-0005_TEM-ISO_AR_06-17-13_D_RS_C0.xlsm

FILE TYPE: Original ▼

LIBBY

TEM Asbestos Structure Count

Laboratory ID:	EMSL27 ▼	EPA Sample Number:	BA-00050	Tag	AL1 ▼
Instrument ID	OL 100 CX II (27-2)	Matrix	Air ▼		
Voltage (KV)	100	Air volume (L), dust sample area (cm ²), or dustfall container area (cm ²):	806		
Magnification (do not include X)	4,800	Date received by lab	5/21/2013		
Grid opening area (mm ²)	0.0130	Lab Job Number:	271300245		
Scale: 1L =	1.000	Lab Sample Number:	271300245-0005		
Scale: 1D =	1.000	Number of grids prepared	10		
Primary filter area (mm ²)	385.0	Prepared by (e.g., M. Smith)	D. Barney		
Secondary Filter Area (mm ²)	360.0	Preparation date	6/10/2013		
Category	Field ▼	EPA COC Number	OU6-052013		
Filter Status	ANALYZED ▼	Estimated Particulate Loading (%)	4%		

Analyzed by (e.g., M. Smith)	E. Wyatt-Pescador	
Analysis date	6/17/2013	
Prep	Direct ▼	
If sample type = air, is there loose material or debris in the cowl?	No ▼	
Analysis Method	TEM-ISO ▼	
Analysis Method SOP	ISO 10312	
Grid storage location	2713-LIB-53	
Archive filter(s) storage location	Cinnaminson	
F- factor	1	
Lab QC Type	Recount Same ▼	

Recording Rules:

3:1 ▼	Minimum Aspect Ratio
5.00	Minimum Length (um)
0.25	Minimum Width (um)

Stopping Rules:

0.00090	Target Sensitivity
41	GOs required to reach target
10.000	Maximum Area Examined (mm ²)
770	GOs required to reach max area
25	Maximum # of Structures
41	Estimated # of GOs required

F-factor Calculation:

Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing [For dust and dustfall, enter 1.0]
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

	F-factor
--	----------

Grid opening traverse direction:	V
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Supplemental Air Analysis

☐ Check box if supplemental analysis☐ Achieved sensitivity (cc⁻¹) from the original analysis

Note: When the box is checked above, the est. # of GOs required that is calculated will automatically take into account the GOs examined during the original analysis.

COMMENTS

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LIBBY
TEM Asbestos Structure Count

OU6-052013_BA-00050_271300245-0005_TEM-ISO_AR_06-17-13_D_RS_C0.xlsm

EPA SAMPLE ID: BA-00050
 LAB SAMPLE ID: 271300245-0005

Matrix: Air
 Analysis Method: TEM-ISO

Prep: Direct
 QC Type: RS

ERROR CHECK
 OK - No errors found

Data Entry by (e.g., M. Smith): A. Fearfield
 Data Entry date: 7/2/2013

QA by (e.g., M. Smith): M. Smollock
 QA date: 7/2/2013

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions (a)		Identification	Mineral Class (b)				Mineral Desc (c)	EDXA Obs (d)	Comments	1 = yes, blank = no			CH Not Counted (e)
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
I1	A1	ND																
I1	A3	ND																
I1	A5	ND																
I1	A7	ND																
I1	A9	ND																
I3	B1	ND																
I3	B3	ND																
I3	B5	ND																
I3	B7	ND																
I3	B9	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID:	EMSL27
Instrument ID	JEOL 100 CX II (27-2)
Voltage (KV)	100
Mag.	4800
Grid opening area (mm2)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	360
Category (Field, Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00032	Tag:	AL1
Matrix (A=Air, D=Dust, DF = Dustfall):	A		
Air volume (L), dust area (cm2), or dustfall container area (cm2)	700 780 ^{ms} 712/13		
Date received by lab	5/21/2013		
Lab Job Number:	271300245		
Lab Sample Number:	271300245-0001		
Number of grids prepared	10		
Prepared by	D. Barney		
Preparation date	6/10/2013		
EPA COC Number:	OU6-052013		
Secondary filter pore size (um)	0.2		

Analyzed by:	E. Wyatt-Pescador
Analysis date	6/13/2013
Method (D=Direct, I=Indirect, IA=Indirect-ashed)	D
If sample type = air, is there loose material or debris in the cow? (Yes, No)	No
Analysis Method (TEM-ISO, TEM-AHERA, TEM-ASTM)	TEM-ISO
Grid storage location	2713-LIB-53
Archive filter(s) storage location	Cinnaminson
Lab QC Type (Not QC, Re-count Same, Re-count Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QC
Estimated Particulate Loading (%)	5

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right----->

<u>Recording Rules:</u>	
Minimum Aspect Ratio (circle one):	none <u>≥ 3:1</u> ≥ 5:1
Minimum Length (um):	5
Minimum Width (um):	0.25

<u>Stopping Rules:</u>	
Target Sensitivity:	0.0009
Max Area Examined:	10
Target # of Structures:	25

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Mineral Desc	EDXA	Sketch/ Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A1	B2	ND																
	B4	ND																
	B6	ND																
	B8	ND																
	B10	ND																
	C1	ND																
	C3	ND																
	C5	ND																
	C7	ND																
	C9	ND																

F-factor Calculation:

Indirect Prep Inputs

<input type="text"/>	Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)
<input type="text"/>	First resuspension volume or rinse volume (mL)
<input type="text"/>	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

<input type="text"/>	Second resuspension volume (mL)
<input type="text"/>	Volume applied to secondary filter (mL) or used for serial dilution
<input type="text"/>	Third resuspension volume (mL)
<input type="text"/>	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

<input type="text"/>	Fraction of secondary filter used for ashing
----------------------	--

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

CH = Chrysotile

NAM = Non-asbestos material

Are prepped grids acceptable for analysis? (circle one) Yes No
If No, explain:

31 If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below:

Analyzed by:	
Analysis date:	
Instrument:	

Grid opening traverse direction (circle one):

<input type="radio"/> H	Horizontal
<input checked="" type="radio"/> V	Vertical

SUPPLEMENTAL AIR ANALYSIS:

<input type="text"/>	Achieved sensitivity (cc ⁻¹) from the original analysis
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LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00032	Lab QC Type	Not QC	Lab Job Number	271300245
Lab Sample Number	271300245-0001	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-53

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A1	D2	ND																
	D4	ND																
	D6	ND																
	D8	ND																
	D10	ND																
	E1	ND																
	E3	ND																
	E5	ND																
	E7	ND																
	E9	ND																
	F2	ND																
	F4	ND																
	F6	ND																
	F8	ND																
	F10	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00032	Lab QC Type	Not QC	Lab Job Number	271300245
Lab Sample Number	271300245-0001	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-53

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A3	A2	ND																
	A4	ND																
	A6	ND																
	A8	ND																
	A10	ND																
	B1	ND																
	B3	ND																
	B5	ND																
	B7	ND																
	B9	ND																
	C2	ND																
	C4	ND																
	C6	ND																
	C8	ND																
	C10	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00032	Lab QC Type	Not QC	Lab Job Number	271300245
Lab Sample Number	271300245-0001	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-53

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A3	D1	ND																
	D3	ND																
	D5	ND																
	D7	ND																
	D9	ND																
	E2	ND																
	E4	ND																
	E6	ND																
	E8	ND																
	E10	ND																
STOP 6/13/2017																		

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID:	EMSL27
Instrument ID	JEOL 100 CX II (27-2)
Voltage (KV)	100
Mag.	4800 LOW HIGH
Grid opening area (mm ²)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	360
Category (Field, Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00033	Tag:	AL1
Matrix (A=Air, D=Dust, DF = Dustfall):	A		
Air volume (L), dust area (cm ²), or dustfall container area (cm ²)	658		
Date received by lab	5/21/2013		
Lab Job Number:	271300245		
Lab Sample Number:	271300245-0002		
Number of grids prepared	10		
Prepared by	D. Barney		
Preparation date	6/10/2013		
EPA COC Number:	OU6-052013		
Secondary filter pore size (um)	0.2		

Analyzed by:	E. Wyatt-Pescador
Analysis date	6/13/2013
Method (D=Direct, I=Indirect, IA=Indirect-ashed)	D
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	No
Analysis Method (TEM-ISO, TEM-AHERA, TEM-ASTM)	TEM-ISO
Grid storage location	2713-LIB-53
Archive filter(s) storage location	Cinnaminson
Lab QC Type (Not QC, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QC
Estimated Particulate Loading (%)	4

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right----->

Recording Rules:	
Minimum Aspect Ratio (circle one):	none ≥ 3:1 ≥ 5:1
Minimum Length (um):	5
Minimum Width (um):	0.25

Stopping Rules:	
Target Sensitivity:	0.0009
Max Area Examined:	10
Target # of Structures:	25

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Mineral Desc	EDXA	Sketch/ Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
C1	A2	NO																
	A4	NO																
	A6	NO																
	A8	NO																
	A10	NO																
	B1	NO																
	B3	NO																
	B5	NO																
	B7	NO																
	B9	NO																

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

CH = Chrysotile

NAM = Non-asbestos material

Are prepped grids acceptable for analysis? (circle one) Yes No
If No, explain:

5 If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below.

Analyzed by:	
Analysis date:	
Instrument:	

Grid opening traverse direction (circle one):

V Vertical H Horizontal

SUPPLEMENTAL AIR ANALYSIS:

Achieved sensitivity (cc ⁻¹) from the original analysis

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00033	Lab QC Type	Not QC	Lab Job Number	271300245
Lab Sample Number	271300245-0002	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-53

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
C1	C2	ND																
	C4	ND																
	C6	ND																
	C8	ND																
	C10	ND																
	D1	ND																
	D3	ND																
	D5	ND																
	D7	ND																
	D9	ND																
	E2	ND																
	E4	ND																
	E6	ND																
	E8	ND																
	E10	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00033	Lab QC Type	Not QC	Lab Job Number	271300245
Lab Sample Number	271300245-0002	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-53

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
C3	B2	ND																
	B4	ND																
	B6	ND																
	B8	ND																
	B10	ND																
	C1	ND																
	C3	ND																
	C5	ND																
	C7	ND																
	C9	ND																
	D2	ND																
	D4	ND																
	D6	ND																
	D8	ND																
	D10	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00033	Lab QC Type	Not QC	Lab Job Number	271300245
Lab Sample Number	271300245-0002	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-53

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
C3	E1	ND																
	E3	ND																
	E5	ND																
	E7	ND																
	E9	ND																
	F2	ND																
	F4	ND																
	F6	ND																
	F8	ND																
	F10	ND																
	G1	ND																
	G3	ND																
	G5	ND																
	G7	ND																
	G9	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID:	EMSL27
Instrument ID	JEOL 100 CX II (27-2)
Voltage (KV)	100
Mag.	4800
Grid opening area (mm ²)	0.042
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	360
Category (Field, Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00040	Tag:	AL1
Matrix (A=Air, D=Dust, DF = Dustfall):	A		
Air volume (L), dust area (cm ²), or dustfall container area (cm ²)	780		
Date received by lab	5/21/2013		
Lab Job Number:	271300245		
Lab Sample Number:	271300245-0003		
Number of grids prepared	10		
Prepared by	D. Barney		
Preparation date	6/10/2013		
EPA COC Number:	OU6-052013		
Secondary filter pore size (um)	0.2		

Analyzed by:	E.Wyatt-Pescador
Analysis date	6/13/2013
Method (D=Direct, I=Indirect, IA=Indirect-ashed)	D
If sample type = air, is there loose material or debris in the bowl? (Yes, No)	No
Analysis Method (TEM-ISO, TEM-AHERA, TEM-ASTM)	TEM-ISO
Grid storage location	2713-LIB-53
Archive filter(s) storage location	Cinnaminson
Lab QC Type (Not QC, Re-count Same, Re-count Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QC
Estimated Particulate Loading (%)	4

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right---->

<u>Recording Rules:</u>	
Minimum Aspect Ratio (circle one):	none <u>≥ 3:1</u> ≥ 5:1
Minimum Length (um):	5
Minimum Width (um):	0.25

<u>Stopping Rules:</u>	
Target Sensitivity:	0.0009
Max Area Examined:	10
Target # of Structures:	25

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Mineral Desc	EDXA	Sketch/ Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
E1	A1	ND																
	A3	ND																
	A5	ND																
	A7	ND																
	A9	ND																
	B2	ND																
	B4	ND																
	B6	ND																
	B8	ND																
	B10	ND																

F-factor Calculation:

Indirect Prep Inputs

<input type="text"/>	Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)
<input type="text"/>	First resuspension volume or rinse volume (mL)
<input type="text"/>	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

<input type="text"/>	Second resuspension volume (mL)
<input type="text"/>	Volume applied to secondary filter (mL) or used for serial dilution
<input type="text"/>	Third resuspension volume (mL)
<input type="text"/>	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

<input type="text"/>	Fraction of secondary filter used for ashing
----------------------	--

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

CH = Chrysotile

NAM = Non-asbestos material

Are prepped grids acceptable for analysis? (circle one) Yes No
If No, explain:

39

If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below.

Analyzed by:	
Analysis date:	
Instrument:	

Grid opening traverse direction (circle one):

<input type="radio"/> H	Horizontal
<input checked="" type="radio"/> V	Vertical

SUPPLEMENTAL AIR ANALYSIS:

<input type="text"/>	Achieved sensitivity (cc ⁻¹) from the original analysis
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LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00040	Lab QC Type	Not QC	Lab Job Number	271300245
Lab Sample Number	271300245-0003	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-53

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
E1	C1	ND																
	C3	ND																
	C5	ND																
	C7	ND																
	C9	ND																
	D2	ND																
	D4	ND																
	D6	ND																
	D8	ND																
	D10	ND																
	E1	ND																
	E3	ND																
	E5	ND																
	E7	ND																
	E9	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00040	Lab QC Type	Not QC	Lab Job Number	271300245
Lab Sample Number	271300245-0003	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-53

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
E3	A2	ND																
	A4	ND																
	A6	ND																
	A8	ND																
	A10	ND																
	B1	ND																
	B3	ND																
	B5	ND																
	B7	ND																
	B9	ND																
	C2	ND																
	C4	ND																
	C6	ND																
	C8	ND																
	C10	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00040	Lab QC Type	Not QC	Lab Job Number	271300245
Lab Sample Number	271300245-0003	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-53

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
E3	D1	ND																
	D3	ND																
	D5	ND																
	D7	ND																
	D9	ND																
	E2	ND																
	E4	ND																
	E6	ND																
	E8	ND																
	E10	ND																
	F1	ND																
	F3	ND																
	F5	ND																
	F7	ND																
	F9	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID:	EMSL27
Instrument ID	JEOL 100 CX II (27-2)
Voltage (KV)	100
Mag.	1500x 70113
Grid opening area (mm ²)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	360
Category (Field, Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00041	Tag:	AL1
Matrix (A=Air, D=Dust, DF = Dustfall):	A		
Air volume (L), dust area (cm ²), or dustfall container area (cm ²)	718		
Date received by lab	5/21/2013		
Lab Job Number:	271300745		
Lab Sample Number:	271300745-0004		
Number of grids prepared	10		
Prepared by	D. Barney		
Preparation date	6/10/2013		
EPA COC Number:	OU6-052013		
Secondary filter pore size (um)	0.2		

Analyzed by:	E.Wyatt-Pescador
Analysis date	6/14/2013
Method (D=Direct, I=Indirect, IA=Indirect-ashed)	D
If sample type = air, is there loose material or debris in the cow? (Yes, No)	No
Analysis Method (TEM-ISO, TEM-AHERA, TEM-ASTM)	TEM-ISO
Grid storage location	2713-LIB-53
Archive filter(s) storage location	Cinnaminson
Lab QC Type (Not QC, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QC
Estimated Particulate Loading (%)	4

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right----->

Recording Rules:	
Minimum Aspect Ratio (circle one):	none <u>≥ 3:1</u> ≥ 5:1
Minimum Length (um):	5 0.8
Minimum Width (um):	0.25 None

Stopping Rules:	
Target Sensitivity:	0.0009
Max Area Examined:	10
Target # of Structures:	25

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Mineral Desc	EDXA	Sketch/ Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
G1	B1	ND																
	B3	ND																
	B5	ND																
	B7	ND																
	B9	ND																
	C2	ND																
	C4	ND																
	C6	ND																
	C8	ND																
	C10	ND																

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

CH = Chrysotile

NAM = Non-asbestos material

If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below.

Analyzed by:	
Analysis date:	
Instrument:	

Grid opening traverse direction (circle one):

☒ H Horizontal
☐ V Vertical

Are prepped gnds acceptable for analysis? (circle one) Yes No
If No, explain:

SUPPLEMENTAL AIR ANALYSIS:

Achieved sensitivity (cc ⁻¹) from the original analysis

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00041	Lab QC Type	Not QC	Lab Job Number	271300245
Lab Sample Number	271300245-0004	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-53

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
G1	D1	ND																
	D3	ND																
	D5	ND																
	D7	ND																
	D9	ND																
	E2	ND																
	E4	ND																
	E6	ND																
	E8	ND																
	E10	ND																
	F1	ND																
	F3	ND																
	F5	ND																
	F7	ND																
	F9	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00041	Lab QC Type	Not QC	Lab Job Number	271300245
Lab Sample Number	271300245-0004	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-53

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
G3	A1	ND																
	A3	ND																
	A5	ND																
	A7	ND																
	A9	ND																
	B2	ND																
	B4	ND																
	B6	ND																
	B8	ND																
	B10	ND																
	C1	ND																
	C3	ND																
	C5	ND																
	C7	ND																
	C9	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38fLaboratory ID EMSL27
Lab Sample Number 271300245-0004EPA Sample Number BA-00041
Matrix ALab QC Type Not QC
Analyst Name E. Wyatt-PescadorLab Job Number 271300245
Grid Storage Loc. 2713-LIB-53

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
G3	D2	ND																
	D4	ND																
	D6	ND																
	D8	ND																
	D10	ND																
	E2	ND																
	E4	ND																
	E6	ND																
	E8	ND																
	E10	ND																
ENCLOSURE 6/14/2013																		

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID:	EMSL27
Instrument ID	JEOL 100 CX II (27-2)
Voltage (KV)	100
Mag.	MS 4800 712113 HIGH LOW
Grid opening area (mm2)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	360
Category (Field, Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00050	Tag:	AL1
Matrix (A=Air, D=Dust, DF = Dustfall):	A		
Air volume (L), dust area (cm2), or dustfall container area (cm2)	806		
Date received by lab	5/21/2013		
Lab Job Number:	27130045		
Lab Sample Number:	27130045-0005		
Number of grids prepared	10		
Prepared by	D. Barney		
Preparation date	6/10/2013		
EPA COG Number:	OU6-052013		
Secondary filter pore size (um)	0.2		

Analyzed by:	E. Wyatt-Pescador
Analysis date	6/14/2013
Method (D=Direct, I=Indirect, IA=Indirect-ashed)	D
If sample type = air, is there loose material or debris in the cow? (Yes, No)	No
Analysis Method (TEM-ISO, TEM-AHERA, TEM-ASTM)	TEM-ISO
Grid storage location	2713-LIB-53
Archive filter(s) storage location	Cinnaminson
Lab QC Type (Not QC, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QC
Estimated Particulate Loading (%)	4

F-Factor Calculation (Indirect Preps Only):
Enter data in appropriate cells provided to the right----->

Recording Rules:

Minimum Aspect Ratio (circle one):
none ≥ 3:1 ≥ 5:1

Minimum Length (um): 5

Minimum Width (um): 0.25

Stopping Rules:

Target Sensitivity: 0.0009

Max Area Examined: 10

Target # of Structures: 25

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Mineral Desc	EDXA	Sketch/ Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
I1	A1	ND																
	A3	ND																
	A5	ND																
	A7	ND																
	A9	ND																
	B2	ND																
	B4	ND																
	B6	ND																
	B8	ND																
	B10	ND																

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)

First resuspension volume or rinsate volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

LA = Libby-type amphibole OA = Other (non-Libby type) amphibole CH = Chrysotile NAM = Non-asbestos material

Are prepped grids acceptable for analysis? (circle one) Yes No
If No, explain:

47 If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below.

Analyzed by:	
Analysis date:	
Instrument:	

Grid opening traverse direction (circle one):

H Horizontal
V Vertical

SUPPLEMENTAL AIR ANALYSIS:

Achieved sensitivity (cc⁻¹) from the original analysis

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00050	Lab QC Type	Not QC	Lab Job Number	271300245
Lab Sample Number	271300245-0005	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-53

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
I1	C1	ND																
	C3	ND																
	C5	ND																
	C7	ND																
	C9	ND																
	D2	ND																
	D4	ND																
	D6	ND																
	D8	ND																
	D10	ND																
	E1	ND																
	E3	ND																
	E5	ND																
	E7	ND																
	E9	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00050	Lab QC Type	Not QC	Lab Job Number	271300245
Lab Sample Number	271300245-0005	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-53

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
I3	A2	ND																
	A4	ND																
	A6	ND																
	A8	ND																
	A10	ND																
	B1	ND																
	B3	ND																
	B5	ND																
	B7	ND																
	B9	ND																
	C2	ND																
	C4	ND																
	C6	ND																
	C8	ND																
	C10	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00050	Lab QC Type	Not QC	Lab Job Number	271300245
Lab Sample Number	271300245-0005	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-53

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
I3	D1	ND																
	D3	ND																
	D5	ND																
	D7	ND																
	D9	ND																
	E2	ND																
	E4	ND																
	E6	ND																
	E8	ND																
	E10	ND																
STOP 6/14/2013																		

LIBBY

Analyzed by:	E. Wyatt-Pescado
Analysis date	6/14/2013
Method (D=Direct, I=Indirect, IA=Indirect-ashed)	D
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	No
Analysis Method (TEM-ISO, TEM-AHERA, TEM-ASTM)	TEM-ISO
Grid storage location	2713-LIB-53
Archive filter(s) storage location	Cinnaminson
Lab QC Type (Not QC, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QC
Estimated Particulate Loading (%)	4

Enter data in appropriate cells provided to the right----->

<u>Stopping Rules:</u>	
Target Sensitivity:	0.0009
Max Area Examined:	10
Target # of Structures:	25

F-factor Calculation:

Inputs for Serial Dilutions

Input for Ashing of Secondary Filter

LA = Libby-type amphibole OA = Other (non-Libby type) amphibole CH = Chrysotile NAM = Non-asbestos material

Grid opening traverse direction (circle one):

Analyzed by:		
Analysis date:		
Instrument:		

SUPPLEMENTAL AIR ANALYSIS:

Achieved sensitivity (cc^{-1}) from the original analysis

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00051	Lab QC Type	Not QC	Lab Job Number	271300245
Lab Sample Number	271300245-0006	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-53

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
K2	C2	ND																
	C4	ND																
	C6	ND																
	C8	ND																
	C10	ND																
	D1	ND																
	D3	ND																
	D5	ND																
	D7	ND																
	D9	ND																
	E2	ND																
	E4	ND																
	E6	ND																
	E8	ND																
	E10	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00051	Lab QC Type	Not QC	Lab Job Number	271300245
Lab Sample Number	271300245-0006	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-53

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
K4	B2	ND																
	B4	ND																
	B6	ND																
	B8	ND																
	B10	ND																
	C1	ND																
	C3	ND																
	C5	ND																
	C7	ND																
	C9	ND																
	D2	ND																
	D4	ND																
	D6	ND																
	D8	ND																
	D10	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00051	Lab QC Type	Not QC	Lab Job Number	271300245
Lab Sample Number	271300245-0006	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-53

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
K4	E1	ND																
	E3	ND																
	E5	ND																
	E7	ND																
	E9	ND																
	F2	ND																
	F4	ND																
	F6	ND																
	F8	ND																
	F10	ND																
Stop 6/14/2013																		

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID:	EMSL27
Instrument ID	JEOL 100 CX II (27-2)
Voltage (KV)	100
Mag.	<u>ms 4,800 X</u> <u>70113</u>
Grid opening area (mm ²)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	360
Category (Field, Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00061	Tag:	AL1
Matrix (A=Air, D=Dust, DF = Dustfall):	A		
Air volume (L), dust area (cm ²), or dustfall container area (cm ²)	630		
Date received by lab	5/21/2013		
Lab Job Number:	271300745		
Lab Sample Number:	271300745-0007		
Number of grids prepared	10		
Prepared by	D. Barney		
Preparation date	6/10/2013		
EPA COC Number:	OU6-052013		
Secondary filter pore size (um)	0.2		

Analyzed by:	E. Wyatt-Pescador
Analysis date	6/14/2013
Method (D=Direct, I=Indirect, IA=Indirect-ashed)	D
If sample type = air, is there loose material or debris in the cow? (Yes, No)	No
Analysis Method (TEM-ISO, TEM-AHERA, TEM-ASTM)	TEM-ISO
Grid storage location	2713-LIB-53
Archive filter(s) storage location	Cinnaminson
Lab QC Type (Not QC, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QC
Estimated Particulate Loading (%)	<u>4</u>

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right----->

<u>Recording Rules:</u>	
Minimum Aspect Ratio (circle one):	none <u>≥ 3:1</u> ≥ 5:1
Minimum Length (um):	<u>5</u>
Minimum Width (um):	<u>0.25</u> none

<u>Stopping Rules:</u>	
Target Sensitivity:	0.0009
Max Area Examined:	10
Target # of Structures:	25

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Mineral Desc	EDXA	Sketch/ Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
M2	A1	ND																
	A3	ND																
	A5	ND																
	A7	ND																
	A9	ND																
	B2	ND																
	B4	ND																
	B6	ND																
	B8	ND																
	B10	ND																

F-factor Calculation:

Indirect Prep Inputs

	Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)
	First resuspension volume or rinsate volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

CH = Chrysotile

NAM = Non-asbestos material

Are prepped grids acceptable for analysis? (circle one) Yes No
If No, explain:

55 If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below:

Analyzed by:	
Analysis date:	
Instrument:	

Grid opening traverse direction (circle one):

H Horizontal
V Vertical

SUPPLEMENTAL AIR ANALYSIS:

	Achieved sensitivity (cc ⁻¹) from the original analysis
--	---

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EML27	EPA Sample Number	BA-00061	Lab QC Type	Not QC	Lab Job Number	271300245
Lab Sample Number	271300245-0007	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-53

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
M2	C1	NO																
	C3	NO																
	C5	NO																
	C7	NO																
	C9	NO																
	D2	NO																
	D4	NO																
	D6	NO																
	D8	NO																
	D10	NO																
	E1	NO																
	E3	NO																
	E5	NO																
	E7	NO																
	E9	NO																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00061	Lab QC Type	Not QC	Lab Job Number	271300245
Lab Sample Number	271300245-0007	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-53

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
M4	A2	ND																
	A4	ND																
	A6	ND																
	A8	ND																
	A10	ND																
	B1	ND																
	B3	ND																
	B5	ND																
	B7	ND																
	B9	ND																
	C2	ND																
	C4	ND																
	C6	ND																
	C8	ND																
	C10	ND																

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00061	Lab QC Type	Not QC	Lab Job Number	271300245
Lab Sample Number	271300245-0007	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-53

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
M4	D1	NO																
	D3	NO																
	D5	NO																
	D7	NO																
	D9	NO																
	E2	NO																
	E4	NO																
	E6	NO																
	E8	NO																
	E10	NO																
★ M6	B1	NO																
	B3	NO																
	B5	NO																
Setup 7/1/2013																		

★ = Additional Grid openings analyzed on 7/1/2013

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID:	EMSL27
Instrument ID	JEOL 100 CX II (27-2)
Voltage (KV)	100
Mag.	<u>4,800</u> X <u>12,113</u> X
Grid opening area (mm ²)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	360
Category (Field, Blank)	Field
Primary filter pore size (um)	0.8

HIGH
LOW

EPA Sample Number:	BA-00062	Tag:	AL1
Matrix (A=Air, D=Dust, DF = Dustfall):	A		
Air volume (L), dust area (cm ²), or dustfall container area (cm ²)	602		
Date received by lab	5/21/2013		
Lab Job Number:	271300645		
Lab Sample Number:	271300645-0008		
Number of grids prepared	10		
Prepared by	D. Barney		
Preparation date	6/10/2013		
EPA COC Number:	OU6-052013		
Secondary filter pore size (um)	0.2		

Analyzed by:	E. Wyatt-Pescador
Analysis date	6/14/2013
Method (D=Direct, I=Indirect, IA=Indirect-ashed)	D
If sample type = air, is there loose material or debris in the cow? (Yes, No)	No
Analysis Method (TEM-ISO, TEM-AHERA, TEM-ASTM)	TEM-ISO
Grid storage location	2713-LIB-53
Archive filter(s) storage location	Cinnaminson
Lab QC Type (Not QC, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QC
Estimated Particulate Loading (%)	3

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right----->

<u>Recording Rules:</u>	
Minimum Aspect Ratio (circle one):	none <u>≥ 3:1</u> ≥ 5:1
Minimum Length (um):	<u>5</u> 0.6
Minimum Width (um):	<u>0.25</u> none

ms
7/21/13

<u>Stopping Rules:</u>	
Target Sensitivity:	0.0009
Max Area Examined:	10
Target # of Structures:	25

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Mineral Desc	EDXA	Sketch/ Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
02	D2	ND																
	D4	ND																
	D6	ND																
	D8	ND																
	D10	ND																
	E1	ND																
	E3	ND																
	E5	ND																
	E7	ND																
	E9	ND																

F-factor Calculation:

Indirect Prep Inputs

<input type="text"/>	Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)
<input type="text"/>	First resuspension volume or rinse volume (mL)
<input type="text"/>	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

<input type="text"/>	Second resuspension volume (mL)
<input type="text"/>	Volume applied to secondary filter (mL) or used for serial dilution
<input type="text"/>	Third resuspension volume (mL)
<input type="text"/>	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

<input type="text"/>	Fraction of secondary filter used for ashing
----------------------	--

LA = Libby-type amphibole OA = Other (non-Libby type) amphibole CH = Chrysotile NAM = Non-asbestos material

Are prepped grids acceptable for analysis? (circle one) Yes No
If No, explain: _____

If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below.

Analyzed by:	
Analysis date:	
Instrument:	

Grid opening traverse direction (circle one):

H Horizontal
V Vertical

SUPPLEMENTAL AIR ANALYSIS:

<input type="text"/>	Achieved sensitivity (cc ⁻¹) from the original analysis
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LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00062	Lab QC Type	Not QC	Lab Job Number	271300245
Lab Sample Number	271300245-0008	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-53

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
O2	F2	ND																
	F4	ND																
	F6	ND																
	F8	ND																
	F10	ND																
	G1	ND																
	G3	ND																
	G5	ND																
	G7	ND																
	G9	ND																
	H2	ND																
	H4	ND																
	H6	ND																
	H8	ND																
	H10	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00062	Lab QC Type	Not QC	Lab Job Number	271300245
Lab Sample Number	271300245-0008	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-53

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
02	I1	ND																
	I3	ND																
	I5	ND																
	I7	ND																
	I9	ND																
04	B2	ND																
	B4	ND																
	B6	ND																
	B8	ND																
	B10	ND																
	C1	ND																
	C3	ND																
	C5	ND																
	C7	ND																
	C9	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00062	Lab QC Type	Not QC	Lab Job Number	271300245
Lab Sample Number	271300245-0008	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-53

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
04	D2	ND																
	D4	ND																
	D6	ND																
	D8	ND																
	D10	ND																
	E1	ND																
	E3	ND																
	E5	ND																
	E7	ND																
	E9	ND																
	F2	ND																
	F4	ND																
	F6	ND																
	F8	ND																
	F10	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27
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EPA Sample Number	BA-00062
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Lab QC Type	Not QC
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Lab Job Number	271300245
----------------	-----------

Lab Sample Number	271300245-0008
-------------------	----------------

Matrix A

Analyst Name E. Wyatt-Pescador

Grid Storage Loc. 2713-LIB-53

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
04	61	ND																
	63	ND																
	65	ND																
	67	ND																
	69	ND																
<div style="border: 1px solid black; width: 100%; height: 100%; transform: rotate(-45deg); position: relative;"> STOP 6/14/2013 </div>																		

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID:	EMSL27
Instrument ID	JEOL 100 CX II (27-2)
Voltage (KV)	100
Mag.	4,500X ms 7/2/13
Grid opening area (mm ²)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	360
Category (Field, Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00050	Tag:	AL1
Matrix (A=Air, D=Dust, DF = Dustfall):	A		
Air volume (L), dust area (cm ²), or dustfall container area (cm ²)	806		
Date received by lab	5/21/2013		
Lab Job Number:	271300245		
Lab Sample Number:	271300245-0005		
Number of grids prepared	10		
Prepared by	D. Barney		
Preparation date	6/10/2013		
EPA COC Number:	OU6-052013		
Secondary filter pore size (um)	0.2		

Analyzed by:	E. Wyatt-Pescador
Analysis date	6/17/2013
Method (D=Direct, I=Indirect, IA=Indirect-ashed)	D
If sample type = air, is there loose material or debris in the cowl? (Yes, No)	No
Analysis Method (TEM-ISO, TEM-AHERA, TEM-ASTM)	TEM-ISO
Grid storage location	2713-LIB-53
Archive filter(s) storage location	Cinnaminson
Lab QC Type (Not QC, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Recount Same
Estimated Particulate Loading (%)	4

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right----->

Recording Rules:

Minimum Aspect Ratio (circle one):

none ≥ 3:1 ≥ 5:1Minimum Length (um): 5Minimum Width (um): 0.25Stopping Rules:

Target Sensitivity: 0.0009

Max Area Examined: 10

Target # of Structures: 25

F-factor Calculation:

Indirect Prep Inputs

<input type="checkbox"/>	Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)
<input type="checkbox"/>	First resuspension volume or rinse volume (mL)
<input type="checkbox"/>	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

<input type="checkbox"/>	Second resuspension volume (mL)
<input type="checkbox"/>	Volume applied to secondary filter (mL) or used for serial dilution
<input type="checkbox"/>	Third resuspension volume (mL)
<input type="checkbox"/>	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

<input type="checkbox"/>	Fraction of secondary filter used for ashing
--------------------------	--

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Mineral Desc	EDXA	Sketch/ Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
I1	A1	ND																
	A3	ND																
	A5	ND																
	A7	ND																
	A9	ND																
I3	B1	ND																
	B3	ND																
	B5	ND																
	B7	ND																
	B9	ND																

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

CH = Chrysotile

NAM = Non-asbestos material

If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below.

Analyzed by:	
Analysis date:	
Instrument:	

Grid opening traverse direction (circle one):

H Horizontal
 V Vertical

Are prepped grids acceptable for analysis? (circle one) Yes No
If No, explain:SUPPLEMENTAL AIR ANALYSIS:Achieved sensitivity (cc⁻¹) from the original analysis

**Data Summary Report:
Outdoor Activity-based Sampling
Air Re-analysis Results**

**Libby Asbestos Superfund Site, Operable Unit 6
Libby, Montana**

**Appendix B
Database**

Note: The Database is provided electronically

**Data Summary Report:
Outdoor Activity-based Sampling
Air Re-analysis Results**

**Libby Asbestos Superfund Site, Operable Unit 6
Libby, Montana**

**Appendix C
Data Verification Report**

**Data Verification Report:
Outdoor Activity-based Sampling
Air Re-analysis Results**

**Libby Asbestos Superfund Site, Operable Unit 6
Libby, Montana**

February 2014

Contract No. W9128F-11-D-0023
Task Order No. 0006

Prepared for:



**U.S. ENVIRONMENTAL PROTECTION AGENCY
Region 8**

Prepared by:



U.S. Army Corps of Engineers
Omaha District
Offutt AFB, Nebraska 68113

and



CDM Federal Programs Corporation
555 17th Street, Suite 1100
Denver, Colorado 80202

TEM CONSISTENCY REVIEW AND DATA TRANSFER VERIFICATION REPORT

Project/Dataset Description: Libby Asbestos Superfund Site, Operable Unit 6, Outdoor Activity-Based Sampling, Air Re-analysis Results

SUMMARY OF FINDINGS AND DATA QUALITY IMPLICATIONS

A verification of 10% of the OU6 ABS air sample analysis results by transmission electron microscopy (TEM) International Organization for Standardization (ISO) 10312 was performed. This verification effort was based on the Libby Scribe databases and the final laboratory reports as provided by TechLaw in accordance with Standard Operating Procedure EPA-LIBBY-9 (Revision 2).

One non-critical discrepancy was identified in which the laboratory job number was incorrectly transferred from the benchsheet to the EDD. This issue has been resolved by the analytical laboratory, the necessary corrections have been made to the EDD and the revised EDD has been loaded to the project database.

It was noted for one analysis that the laboratory examined adjacent grid openings beginning about mid-way through the analysis. As documented in Libby-specific laboratory modification LB-000016H, preferential selection of adjacent grid openings is permissible for analyses with greater than or equal to 50 grid openings. Because the laboratory examined over 200 grid openings in this analysis, there are no negative data quality implications.

The Data Verification Coordinator has performed a check of 5% of the analyses verified to ensure that any potential issues were identified correctly. No deficiencies were noted.

RECOMMENDATIONS FOR FUTURE REVIEW AND VERIFICATION

No critical issues were identified in this dataset, therefore, there is no need to perform future review or verification efforts for this dataset. In addition, there are no negative data quality implications because the issue discovered during the verification effort was non-critical in nature and has been resolved.

Data Verifier: Natalie Kor
Data Verification Coordinator: Emily Funnell
Verification Data Manager*: Natalie Kor

Date: 2.25.14
Date: 2/25/14
Date: 2.25.14

ATTACHMENT 1A. DATA SUMMARY OF ANALYTICAL AND RESULT INFORMATION

DVC - 5%	Sample Date	Samp No	File Revision No	Lab ID	Instrument	Mag Low	GO Size	EFA	Tag	Analysis Quantity	Analysis Quantity Units	Receipt Date	Lab Job Number	Lab SampleID	Number Grid Prep	Preparer Name	Prep Date	Analyst Name	Analysis Date	Prep Method	Loose Material	Analysis Method	Est Filter Loading	Indirect Fraction Primary Filter	Aliquot 1	Volume 1	F Factor	Analysis Comments	Recording Rules			Stopping Rules		Grid Openings Counted		STRUCTCNTPCME			Sensitivity		STRUCTCONPCME			Stopping Rule Achieved	Verifier's Company	Verifier's Name	Comment	Correction Date	
																													Min AR Low	Min Length Low	Min Width Low	Target Sens	Max Area Examined	Target N Strucs	LA/OA Low	Chrys Low	LA	OA	CH	LA/OA	CH	LA	OA						CH
	9/17/2008	BA-00001	0	EMSL27	JEOL 100 CX II (27-2)	4800	0.013	360	AL1	1,344	L	5/21/2013	271300244	271300244-0001	10	E. Wyatt-Pesc	4/15/2009	E. Wyatt-Pescador	6/19/2013	Indirect - As	No	TEM-ISO	12	0.5	50	100	0.25		3:1	5	0.25	0.00040	10	25	210	210	0	0	0	0.00039	0.00039	0	0	0	Sensitivity	CDM Smith	N. Ross	Verifier's note: Lab examined adjacent grid openings, beginning about half way through the analysis.	
EF	9/23/2008	BA-00041	1	EMSL27	JEOL 100 CX II (27-2)	4800	0.013	385	AL1	718	L	5/21/2013	271300245	271300245-0004	10	D. Barney	6/10/2013	E. Wyatt-Pescador	6/14/2013	Direct	No	TEM-ISO	4				1	Correction 1 on 11/20/2013 to remove extra "0" from lab job number.	3:1	5	0.25	0.00090	10	25	50	50	0	0	0	0.00082	0.00082	0	0	0	Sensitivity	CDM Smith	N. Ross	Lab job number is 271300245, not 2713000245 according to benchsheet.	11/22/2013

ATTACHMENT 1B. DATA SUMMARY OF STRUCTURE INFORMATION

Sample No	StructureID	Row Index	Grid	Opening	Structure Type	Primary	Total	Length	Width	AR	Mineral Class	Mineral Desc	LUXA Observatio n	Structure Identificati on	Chrysotile Count	Low Mag	Structure Comment	Verifier's Company	Verifier's Name	Comment	Correction Date	DVC
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 1	1	A1	B1	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 2	2	A1	B3	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 3	3	A1	B5	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 4	4	A1	B7	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 5	5	A1	B9	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 6	6	A1	C2	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 7	7	A1	C4	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 8	8	A1	C6	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 9	9	A1	C8	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 10	10	A1	C10	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 11	11	A1	D1	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 12	12	A1	D3	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 13	13	A1	D5	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 14	14	A1	D7	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 15	15	A1	D9	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 16	16	A1	E2	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 17	17	A1	E4	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 18	18	A1	E6	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 19	19	A1	E8	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 20	20	A1	E10	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 21	21	A1	F1	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 22	22	A1	F3	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 23	23	A1	F5	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 24	24	A1	F7	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 25	25	A1	F9	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 26	26	A1	G2	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 27	27	A1	G4	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 28	28	A1	G6	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 29	29	A1	G8	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 30	30	A1	G10	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 31	31	A1	H1	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 32	32	A1	H3	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 33	33	A1	H5	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 34	34	A1	H7	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 35	35	A1	H9	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 36	36	A1	I2	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 37	37	A1	I4	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 38	38	A1	I6	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 39	39	A1	I8	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 40	40	A1	I10	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 41	41	A1	J1	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 42	42	A1	J3	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 43	43	A1	J5	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 44	44	A1	J7	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 45	45	A1	J9	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 46	46	A3	A2	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 47	47	A3	A4	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 48	48	A3	A6	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 49	49	A3	A8	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 50	50	A3	A10	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 51	51	A3	A1	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 52	52	A3	B3	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 53	53	A3	B5	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 54	54	A3	B7	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 55	55	A3	B9	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 56	56	A3	C2	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 57	57	A3	C4	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 58	58	A3	C6	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 59	59	A3	C8	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 60	60	A3	C10	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 61	61	A3	D1	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 62	62	A3	D3	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 63	63	A3	D5	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 64	64	A3	D7	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 65	65	A3	D9	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 66	66	A3	E2	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 67	67	A3	E4	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 68	68	A3	E6	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 69	69	A3	E8	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 70	70	A3	E10	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 71	71	A3	F1	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 72	72	A3	F3	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 73	73	A3	F5	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 74	74	A3	F7	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 75	75	A3	F9	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 76	76	A3	G2	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 77	77	A3	G4	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 78	78	A3	G6	ND										Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed NotQOC, TEM-ISO, 79	79	A3	G8	ND										Yes	Yes		CDM Smith				

ATTACHMENT 1B. DATA SUMMARY OF STRUCTURE INFORMATION

Samp No	StructureID	Row Index	Grid	Grid Disting	Structure Type	Primary	Total	Length	Width	AR	Mineral Class	Mineral Desc	LUMA Observatio n	Structure Identificati on	Chrysotile Count	Low Mag	Structure Comment	Verifier's Company	Verifier's Name	Comment	Correction Date	DVC
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_135	135	A5	O10	ND		136								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_136	136	A5	E1	ND		137								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_137	137	A5	E2	ND		138								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_138	138	A5	E3	ND		139								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_139	139	A5	E4	ND		140								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_140	140	A5	E5	ND		141								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_141	141	A5	E6	ND		142								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_142	142	A5	E7	ND		143								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_143	143	A5	E8	ND		144								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_144	144	A5	E9	ND		145								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_145	145	A5	E10	ND		146								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_146	146	A5	F1	ND		147								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_147	147	A5	F2	ND		148								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_148	148	A5	F3	ND		149								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_149	149	A5	F4	ND		150								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_150	150	A5	F5	ND		151								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_151	151	A5	F6	ND		152								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_152	152	A5	F7	ND		153								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_153	153	A5	F8	ND		154								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_154	154	A5	F9	ND		155								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_155	155	A5	F10	ND		156								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_156	156	A5	G1	ND		157								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_157	157	A5	G2	ND		158								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_158	158	A5	G3	ND		159								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_159	159	A5	G4	ND		160								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_160	160	A5	G5	ND		161								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_161	161	A5	G6	ND		162								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_162	162	A5	G7	ND		163								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_163	163	A5	G8	ND		164								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_164	164	A5	G9	ND		165								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_165	165	A5	G10	ND		166								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_166	166	A5	H1	ND		167								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_167	167	A5	H2	ND		168								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_168	168	A5	H3	ND		169								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_169	169	A5	H4	ND		170								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_170	170	A5	H5	ND		171								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_171	171	A5	H6	ND		172								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_172	172	A5	H7	ND		173								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_173	173	A5	H8	ND		174								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_174	174	A5	H9	ND		175								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_175	175	A5	H10	ND		176								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_176	176	A5	I1	ND		177								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_177	177	A5	I2	ND		178								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_178	178	A5	I3	ND		179								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_179	179	A5	I4	ND		180								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_180	180	A5	I5	ND		181								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_181	181	A5	I6	ND		182								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_182	182	A5	I7	ND		183								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_183	183	A5	I8	ND		184								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_184	184	A5	I9	ND		185								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_185	185	A5	I10	ND		186								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_186	186	A5	J1	ND		187								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_187	187	A5	J2	ND		188								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_188	188	A5	J3	ND		189								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_189	189	A5	J4	ND		190								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_190	190	A5	J5	ND		191								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_191	191	A5	J6	ND		192								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_192	192	A5	J7	ND		193								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_193	193	A5	J8	ND		194								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_194	194	A5	J9	ND		195								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_195	195	A5	J10	ND		196								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_196	196	A7	A1	ND		197								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_197	197	A7	A2	ND		198								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_198	198	A7	A3	ND		199								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_199	199	A7	A4	ND		200								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_200	200	A7	A5	ND		201								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_201	201	A7	A6	ND		202								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_202	202	A7	A7	ND		203								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_203	203	A7	A8	ND		204								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_204	204	A7	A9	ND		205								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_205	205	A7	A10	ND		206								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_206	206	A7	B1	ND		207								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_207	207	A7	B2	ND		208								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_208	208	A7	B3	ND		209								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_209	209	A7	B4	ND		210								Yes	Yes		CDM Smith	N. Ross			
BA-00001	271300244-0001, Indirect-Ashed_NotIQC_TEM-ISQ_210	210	A7	B5	ND		1								Yes	Yes		CDM Smith	N. Ross			
BA-00041	271300245-0004, Direct_NotIQC_TEM-ISQ_1	1	G1	B1	ND		2								Yes	Yes						

ATTACHMENT 2 – TEM LABORATORY BENCHSHEETS

LIBBY
TEM Asbestos Structure Count Air-Dust EDD_38f

Laboratory ID:	EMSL27
Instrument ID	JEOL 100 CX II (27-2)
Voltage (KV)	100
Mag.	4,800 X
Grid opening area (mm ²)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm ²)	385
Secondary Filter Area (mm ²)	360
Category (Field, Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00001	Tag:	AL1
Matrix (A=Air, D=Dust, DF = Dustfall):	A		
Air volume (L), dust area (cm ²), or dustfall container area (cm ²)	1344		
Date received by lab	5/21/2013		
Lab Job Number:	271300244		
Lab Sample Number:	271300244-0001		
Number of grids prepared	10		
Prepared by	E. Wyatt-Pescador		
Preparation date	4/15/2009		
EPA COC Number:	0412-003		
Secondary filter pore size (um)	0.2		

Analyzed by:	E. Wyatt-Pescador
Analysis date	6/19/2013
Method (D=Direct, I=Indirect, IA=Indirect-ashed)	IA
If sample type = air, is there loose material or debris in the cow? (Yes, No)	No
Analysis Method (TEM-ISO, TEM-AHERA, TEM-ASTM)	TEM-ISO
Grid storage location	2713-LIB-56
Archive filter(s) storage location	ESAT Archive
Lab QC Type (Not QC, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QC
Estimated Particulate Loading (%)	12

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right—>

Recording Rules:	
Minimum Aspect Ratio (circle one):	none <u>≥ 3:1</u> ≥ 5:1
Minimum Length (um):	<u>5</u>
Minimum Width (um):	<u>0.25</u> None

Stopping Rules:	
Target Sensitivity:	0.0004
Max Area Examined:	10
Target # of Structures:	25

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Mineral Desc	EDXA	Sketch/ Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A1	B1	NO																
	B3	NO																
	B5	NO																
	B7	NO																
	B9	NO																
	C2	NO																
	C4	NO																
	C6	NO																
	C8	NO																
	C10	NO																

F-factor Calculation:

Indirect Prep Inputs

<u>1/2</u>	Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)
<u>100</u>	First resuspension volume or rinse volume (mL)
<u>50</u>	Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

	Second resuspension volume (mL)
	Volume applied to secondary filter (mL) or used for serial dilution
	Third resuspension volume (mL)
	Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

	Fraction of secondary filter used for ashing
--	--

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

CH = Chrysotile

NAM = Non-asbestos material

Are prepped grids acceptable for analysis? (circle one) Yes No
If No, explain:

SUPPLEMENTAL AIR ANALYSIS:

Achieved sensitivity (cc⁻¹) from the original analysis

If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below.

Analyzed by:	
Analysis date:	
Instrument:	

Grid opening traverse direction (circle one):

<u>H</u>	Horizontal
<u>V</u>	Vertical

0/210

nw

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00001	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0001	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A1	D1	NO																
	D3	NO																
	D5	NO																
	D7	NO																
	D9	NO																
	E2	NO																
	E4	NO																
	E6	NO																
	E8	NO																
	E10	NO																
	F1	NO																
	F3	NO																
	F5	NO																
	F7	NO																
	F9	NO																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00001	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0001	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A1	G2	ND																
	G4	ND																
	G6	ND																
	G8	ND																
	G10	ND																
	H1	ND																
	H3	ND																
	H5	ND																
	H7	ND																
	H9	ND																
	I2	ND																
	I4	ND																
	I6	ND																
	I8	ND																
	I10	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00001	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0001	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A1	J1	ND																
	J3	ND																
	J5	ND																
	J7	ND																
	J9	ND																
A3	A2	ND																
	A4	ND																
	A6	ND																
	A8	ND																
	A10	ND																
	B1	ND																
	B3	ND																
	B5	ND																
	B7	ND																
	B9	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00001	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0001	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A3	C2	NO																
	C4	NO																
	C6	NO																
	C8	NO																
	C10	NO																
	D1	NO																
	D3	NO																
	D5	NO																
	D7	NO																
	D9	NO																
	E2	NO																
	E4	NO																
	E6	NO																
	E8	NO																
	E10	NO																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00001	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0001	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A3	F1	ND																
	F3	ND																
	F5	ND																
	F7	ND																
	F9	ND																
	G2	ND																
	G4	ND																
	G6	ND																
	G8	ND																
	G10	ND																
	H1	ND																
	H3	ND																
	H5	ND																
	H7	ND																
	H9	ND																

LIBBY
TEM Asbestos Structure Count Air-Dust EDD 38f

Laboratory ID	EMLS27	EPA Sample Number	BA-00001	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0001	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A3	I2	ND																
	I4	ND																
	I6	ND																
	I8	ND																
	I10	ND																
	J1	ND																
	J3	ND																
	J5	ND																
	J7	ND																
	J9	ND																
A5	A1	ND																
	A2	ND																
	A3	ND																
	A4	ND																
	A5	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00001	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0001	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A5	A6	ND																
	A7	ND																
	A8	ND																
	A9	ND																
	A10	ND																
	B1	ND																
	B2	ND																
	B3	ND																
	B4	ND																
	B5	ND																
	B6	ND																
	B7	ND																
	B8	ND																
	B9	ND																
	B10	ND																

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TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00001	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0001	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A5	C1	ND																
	C2	ND																
	C3	ND																
	C4	ND																
	C5	ND																
	C6	ND																
	C7	ND																
	C8	ND																
	C9	ND																
	C10	ND																
	D1	ND																
	D2	ND																
	D3	ND																
	D4	ND																
	D5	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00001	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0001	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A5	D6	ND																
	D7	ND																
	D8	ND																
	D9	ND																
	D10	ND																
	E1	ND																
	E2	ND																
	E3	ND																
	E4	ND																
	E5	ND																
	E6	ND																
	E7	ND																
	E8	ND																
	E9	ND																
	E10	ND																

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TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00001	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0001	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A5	F1	ND																
	F2	ND																
	F3	ND																
	F4	ND																
	F5	ND																
	F6	ND																
	F7	ND																
	F8	ND																
	F9	ND																
	F10	ND																
	G1	ND																
	G2	ND																
	G3	ND																
	G4	ND																
	G5	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00001	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0001	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A5	G6	ND																
	G7	ND																
	G8	ND																
	G9	ND																
	G10	ND																
	H1	ND																
	H2	ND																
	H3	ND																
	H4	ND																
	H5	ND																
	H6	ND																
	H7	ND																
	H8	ND																
	H9	ND																
	H10	ND																

LIBBY

TEM Asbestos Structure Count Air-Dust EDD 38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00001	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0001	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A5	I1	ND																
	I2	ND																
	I3	ND																
	I4	ND																
	I5	ND																
	I6	ND																
	I7	ND																
	I8	ND																
	I9	ND																
	I10	ND																
	J1	ND																
	J2	ND																
	J3	ND																
	J4	ND																
	J5	ND																

LIBBY

TEM Asbestos Structure Count Air-Dust EDD 38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00001	Lab QC Type	Not QC	Lab Job Number	271300244
Lab Sample Number	271300244-0001	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A5	J6	ND																
	J7	ND																
	J8	ND																
	J9	ND																
	J10	ND																
A7	A1	ND																
	A2	ND																
	A3	ND																
	A4	ND																
	A5	ND																
	A6	ND																
	A7	ND																
	A8	ND																
	A9	ND																
	A10	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID

EMSL27

EPA Sample Number

BA-00001

Lab QC Type

Not QC

Lab Job Number

271300244

Lab Sample Number

271300244-0001

Matrix

A

Analyst Name

E. Wyatt-Pescador

Grid Storage Loc.

2713-LIB-56

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
A7	B1	ND																
	B2	ND																
	B3	ND																
	B4	ND																
	B5	ND																
<div style="border: 1px solid black; width: 100%; height: 100%; transform: rotate(-45deg); position: relative;"> STOP 6/19/2013 </div>																		

~~ETJ 6/19/2013~~

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID:	EMSL27
Instrument ID	JEOL 100 CX II (27-2)
Voltage (KV)	100
Mag.	1500x
Grid opening area (mm2)	0.013
Scale: 1L =	1
Scale: 1D =	1
Primary filter area (mm2)	385
Secondary Filter Area (mm2)	360
Category (Field, Blank)	Field
Primary filter pore size (um)	0.8

EPA Sample Number:	BA-00041	Tag:	AL1
Matrix (A=Air, D=Dust, DF = Dustfall):	A		
Air volume (L), dust area (cm2), or dustfall container area (cm2)	718		
Date received by lab	5/21/2013		
Lab Job Number:	271300745		
Lab Sample Number:	271300745-0004		
Number of grids prepared	10		
Prepared by	D. Barney		
Preparation date	6/10/2013		
EPA COC Number:	OU6-052013		
Secondary filter pore size (um)	0.2		

Analyzed by:	E. Wyatt-Pescador
Analysis date	6/14/2013
Method (D=Direct, I=Indirect, IA=indirect-ashed)	D
If sample type = air, is there loose material or debris in the cow? (Yes, No)	No
Analysis Method (TEM-ISO, TEM-AHERA, TEM-ASTM)	TEM-ISO
Grid storage location	2713-LIB-53
Archive filter(s) storage location	Cinnaminson
Lab QC Type (Not QC, Recount Same, Recount Different, Re-prep, Verified Analysis, Reconciliation, Lab Blank, Interlab)	Not QC
Estimated Particulate Loading (%)	4

F-Factor Calculation (Indirect Preps Only):

Enter data in appropriate cells provided to the right----->

Recording Rules:

Minimum Aspect Ratio (circle one):
none ≥ 3:1 ≥ 5:1

Minimum Length (um): 5

Minimum Width (um): 0.25 None

Stopping Rules:

Target Sensitivity: 0.0009

Max Area Examined: 10

Target # of Structures: 25

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class (see below)				Mineral Desc	EDXA	Sketch/ Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
G1	B1	ND																
	B3	ND																
	B5	ND																
	B7	ND																
	B9	ND																
	C2	ND																
	C4	ND																
	C6	ND																
	C8	ND																
	C10	ND																

F-factor Calculation:

Indirect Prep Inputs

Fraction of primary filter used for indirect prep or ashing (For dust and dustfall, enter 1.0)

First resuspension volume or rinse volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Inputs for Serial Dilutions

Second resuspension volume (mL)

Volume applied to secondary filter (mL) or used for serial dilution

Third resuspension volume (mL)

Volume applied to secondary filter (mL)

Input for Ashing of Secondary Filter

Fraction of secondary filter used for ashing

LA = Libby-type amphibole

OA = Other (non-Libby type) amphibole

CH = Chrysotile

NAM = Non-asbestos material

Are prepped grids acceptable for analysis? (circle one) Yes No
If No, explain:

If sample was analyzed by more than one analyst or across multiple analysis dates, enter analysis details below:

Analyzed by:	
Analysis date:	
Instrument:	

Grid opening traverse direction (circle one):

H Horizontal
V Vertical

SUPPLEMENTAL AIR ANALYSIS:

Achieved sensitivity (cc⁻¹) from the original analysis

DVC 52w-EF

φ/50

[Signature]

LIBBY
TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00041	Lab QC Type	Not QC	Lab Job Number	271300245
Lab Sample Number	271300245-0004	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-53

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
G1	D1	ND																
	D3	ND																
	D5	ND																
	D7	ND																
	D9	ND																
	E2	ND																
	E4	ND																
	E6	ND																
	E8	ND																
	E10	ND																
	F1	ND																
	F3	ND																
	F5	ND																
	F7	ND																
	F9	ND																

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00041	Lab QC Type	Not QC	Lab Job Number	271300245
Lab Sample Number	271300245-0004	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-53

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
G3	D2	ND																
	D4	ND																
	D6	ND																
	D8	ND																
	D10	ND																
	E2	ND																
	E4	ND																
	E6	ND																
	E8	ND																
	E10	ND																
STOP 6/14/2013																		

LIBBY

TEM Asbestos Structure Count_Air-DustEDD_38f

Laboratory ID	EMSL27	EPA Sample Number	BA-00041	Lab QC Type	Not QC	Lab Job Number	271300245
Lab Sample Number	271300245-0004	Matrix	A	Analyst Name	E. Wyatt-Pescador	Grid Storage Loc.	2713-LIB-53

Grid	Grid Opening	Structure Type	No. of Structures		Dimensions		Identification	Mineral Class				Mineral Desc	EDXA	Sketch/Comments	1 = yes, blank = no			CH Not Counted
			Primary	Total	Length	Width		LA	OA	CH	NAM				Sketch	Photo	EDS	
G3	A1	ND																
	A3	ND																
	A5	ND																
	A7	ND																
	A9	ND																
	B2	ND																
	B4	ND																
	B6	ND																
	B8	ND																
	B10	ND																
	C1	ND																
	C3	ND																
	C5	ND																
	C7	ND																
	C9	ND																